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# AGRICULTURAL JOURNAL,

AND

## TRANSACTIONS

OF THE

### Lower Canada Agricultural Society.

VOL. 2.

MONTREAL, JUNE, 1849.

NO. 6.

We have seen a notice of a late work published in England by a Mr. Sirr, "China and the Chinese," which appears to be of a highly interesting character, particularly so far as it describes the great attention given to agriculture in China, and the honors bestowed by the Emperors on eminent agriculturists in that country. Every encouragement and protection is afforded to agriculture. Many of the Emperors have written works on the best manner of manuring and cultivating the soil. A great agricultural festival, in which the Emperor himself takes a prominent part, is held annually, and is fully described by Mr. Sirr. This example, from a most industrious, and certainly a great nation, (though we may have overrun the country by comparatively a small military force,) should stimulate us to value our agriculture at its proper estimate. To Canada, it is by far the most important interest in the country, and unquestionably the most neglected. Mr. Sirr's work informs us that the late Emperor of China made a law which is rigidly adhered to by the present Emperor, to the following effect:—

"Having an uncommon and great regard for husbandmen and cultivators of the earth, the emperor orders the governors of every province and city to give information every year, at the Court of Tribunals, held in Pekin, of the person of this profession who is most remarkable in their districts for his application to the culture of the earth, peace with neighbours, preserving union in his own family, and freedom from extravagance. Upon the report of the viceroy or governor being verified, the emperor will raise this diligent and wise husbandman to the degree of mandarin of the eighth order. This distinction is a reward for bestowing care and atten-

tion upon the cultivation of the fruits of the earth, and will enable him who is so honoured to wear the robe of a mandarin; he will also have a right to visit the governor of the city, and to drink tea with him. The husbandman who may receive his token of imperial love will be respected while he lives, and, after his death, he will have funeral obsequies observed in accordance with his rank; and his title of honour and dignities will be inscribed in the hall of his ancestors. All men bow before this mark of imperial favour."

The following law which has for ages been established in China, is deserving of the consideration of all statesmen, and with some modification, might be judiciously applied, especially to the crown lands in Canada:—

"By an ancient law, all neglected or uncultivated lands become forfeited to the Emperor, who grants them to farmers on condition that the land is kept in proper cultivation. The consequence is, that in China, very little uncultivated land is to be seen. A fifth, and in some instances, a fourth part of all produce is reserved for the emperor."

It may be supposed that, in our pretended high state of civilization, we may safely allow every interest to take care of itself, but we are confident, nevertheless, that it will be impossible that this country can rise from its present depression except by the improvement of its agriculture and the augmentation of its products in quantity and value. All attempts to improve our general condition by any other means, will be a failure. In the present state of the world, it is impossible for any country to become permanently prosperous, unless by her own productions, whatever they may be, and we do not hesitate to say that those who think differently as regards this country, labour under a great delusion, and time will prove it. Noth-

ing can be done for Canada that will be more conducive to the general prosperity of her people, than to provide suitable education and instruction for the agricultural classes, who are strictly the producers of the country's wealth. All the laws that could be made in a century, would not be so productive of prosperity to the country as this would be. Canada is not unsuitable for successful agriculture, because a great variety of crops can be raised in it, and in considerable perfection, perhaps in as great perfection in proportion to the cultivation and care bestowed upon them, as in any country whatever. Let justice be done the country, and the attention of our Legislature be devoted to that interest which is to furnish the chief means of prosperity to all other interests, and we shall soon see Canada one of the most prosperous countries on earth. Let our agriculture be estimated as it should be by all wise men, and it will become of some importance to those who now regard it with little favour. We neglect a real and permanent good, and follow after shadows that dissolve before us, when we expect to secure some substantial reality. A large and valuable production, resulting from well directed industry, applied to the cultivation and management of our own lands would not be a shadow that would vanish from our grasp, but would be a substantial good, that would put into prosperous action every trade, business, and profession in the country. We should infinitely prefer being humbly instrumental in assisting to produce this unmixed good to our adopted country, than to be the most successful general or politician that ever existed. There are always circumstances of a doubtful character in the career of either of the latter, however well they act their part, which can never attach to the humble and ardent advocate of agricultural improvement. If we had not these feelings, we should have long ago given up the cause of agriculture, as we never had any reward except the satisfaction of our own mind that our humble exertions might produce some good one time or another.

The time is past, however, to leave our agriculture to help itself. It is now become *necessary* that every possible means should be adopted to advance the improvement of Canadian Agriculture, and it will be a dereliction of duty to the country, if this matter is neglected any longer, on any pretence. We do not presume to point out the means that should be adopted. We only say that this the *first duty* of those who have it in their power, to do all that is practicable to accomplish this important object.

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### CORRESPONDENCE.

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*To the Editor of the AGRICULTURAL JOURNAL.*

SIR,—In your number for April, I ventured some few observations on the subject of Agriculture in general, and touched on some matters which appeared to me to require alteration or correction in the management.

I believe that it will not be denied that the Agricultural County Societies, in the main, have not borne the fruits or yielded the information justly contemplated by many thinking farmers. I will now, with your leave, endeavour briefly to convey my views (the growth of some experience in such matters) of the cause of this disappointment.

The useless expense that the Societies are obliged to incur, through the defective clauses in the Agricultural Act, was sufficiently explained in April last, and can be easily corrected, but the erroneous principle of their constitution may be more difficult to remedy. As the law now stands, the whole body of managing members of the Agricultural Society may, and most probably would, be turned out of office at their first unpopular move; for instance, if they were to presume to set apart any of the collected moneys, in order to appropriate them to some ulterior purposes, such as purchasing foreign seeds, importing improved breeds of cattle, and more approved and efficient Agricultural implements, or with the view to carry out the long cherished hope of a model farm. However clearly the members of the Committee might persuade themselves of the propriety of such a measure—unless the expecting public had been previously persuaded to be of the same

opinion, (sometimes a matter of some difficulty,) their di-solution would be inevitable.

Why the wisdom of the Legislature should have foreseen this state of things, and provided against it in constitutions awarded to almost every other corporation, and neglected and overlooked it in that of the Agricultural Societies, would not now be, in this place, a proper subject for enquiry. But the mischief is evident, and unavoidable by the managers, at least as the law now stands—for any unpopular measure, however well considered and ultimately beneficial, would turn them all out, and perhaps cause another batch to be elected pledged to subvert the measures adopted by their predecessors. But if, on the contrary, the precaution had been taken, as in most other cases, of displacing only one-third or one-fourth of the members every year or every two years, the incoming new Committee-men would have had time to consider and perfectly understand the views and the grounds on which the proceedings were founded before they could entirely subvert them, and destroy in one day the growing fruits of several years. Again, Sir, I may say that the members themselves, in some instances, do not feel the required permanency to induce them to adopt measures that can only be matured by a length of time, when at one swoop they may be all dissolved and “leave not a wreck behind.”

Your too well founded complaints of the very reprehensible silence persisted in by most practical farmers, in relation to the results procured from their several experiments, might be in some measure obviated by obtaining that all the County Agricultural Societies should forward to you a copy of the report of their several visiting judges of growing crops. These gentlemen generally travel, in order to perform the duties they so kindly and generously undertake, through the greater part of the counties for which they act; they are unquestionably the most experienced and intelligent practical farmers; indeed none other will undertake the task, so that from their collective reports and opinions derived from what they have seen as well as actually inspected, a general statement might be made out and published in your valuable Journal, carrying with it great weight and authority highly interesting to every agriculturist, bearing a sort of responsible official character which would present a *point*

*d'appui* for the calculations of the merchant as well as for the practice of the farmer.

But, Sir, this even should it be successfully carried out, is but one short step in advance, and while I am supposing a *point d'appui* for the others, I feel that the interests of agriculture want one for themselves; they want a union, a centrality, from which might emanate the results arrived at by the labours and experience of all the County Societies, and of every individual connected with them, and be disseminated throughout the whole district. If, therefore, the County Societies would agree to such union, and communicate their views to each other, and if, after such communication and mutual *exposé*, they would come to some preliminary understanding, and call a general central meeting of delegates from each—there can be no doubt but that such measures might be might be adopted as would (at no distant date) not leave us very far behind our neighbours in agricultural improvement; the absence hitherto of some such combination of the energies and talent of our country must have been a weight in the balance against us.

I am aware that it may be objected against me that, although I profess myself to be a practical farmer, I have left untouched all the results of my own experience, at the same time that I find fault with others for doing likewise; but I am so well persuaded that organization and combination are, for the present, such indispensable objects to attain, that I have devoted all the indulgence I can hope for exclusively to those subjects; nevertheless, hereafter, I propose to acquit myself of the objection, and enter on that field likewise; and as an earnest of my qualifications for the task, I beg leave to state that I have for many years cultivated a real model farm in this district, on what may be called the prevailing or negative system, and that, therefore, I am, from my experience, competent to point out with the nicest discrimination, all the distinct and various causes of the failure of almost every crop usually cultivated in this country; but as I am determined, this year, to alter entirely my system, with the aid of your valuable Journal, so that when the time shall come I shall be able to discuss, with equal advantages, both sides of the question, that is, the prevailing or negative system, as well as that which I hope soon to see followed up with energy and success by every farmer in the District.

You will easily perceive, Sir, that I am unaccustomed to (if not incapable of) writing for the press; but having had some experience in the matter on which I am addressing you, I consider it in some measure a duty to offer my mite to the all important subject of Agricultural improvement, and albeit not always having handled the plough, I live happy in the conviction that I have never been more usefully or more honourably employed. I beg to repeat that this letter, like my previous one, is entirely at your disposal, as my unpractised hand might commit errors I may not be aware of.

I beg leave to renew to you the assurances of my highest esteem.

TRIPTOLEMUS.

*To the Editor of the AGRICULTURAL JOURNAL.*

DEAR SIR,—It has long been to me a matter of regret and surprise that the occupation of a farmer is held in such little comparative estimation in these townships, and I have latterly endeavoured to answer to my own satisfaction the question, why is it so? The conclusion I have arrived at has diminished my surprise, but not my regret. About here, every youth of *spirit* endeavours to acquire a trade, and if he can obtain admission to a country store as a clerk, his ambition is fully satisfied. In answer to the question I have often put to myself—why is this?—I believe the answer to be, because farming, as generally practised in these townships, is the most unintellectual of all employments. Science throws its light upon every trade, and artisans generally avail themselves of it, but our farmers are for the most part mere ploughing and reaping machines. Knowing but little and caring less for the reason why they plant wheat here or oats there—why lime is used (if used) on this spot and farm manure on that—they work, as the carpenters say, by rule and thumb. It cannot then be wondered at that intelligent youths despise a calling which, *so far as they see*, affords no scope for the exercise of their highest attribute—reason.

What is the remedy? The evil is a great one, and the prosperity of the country depends more on its removal than upon most of the political nostrums that are convulsing the country.

Every winter we are visited by itinerant lecturers on phrenology, temperance, mesmerism,

&c., who are all reasonably encouraged. We engage singing masters and so forth, and endeavour to cultivate and improve ourselves generally when the means are presented to us; and I venture to express my conviction that if qualified lecturers on the science of Agriculture were sent abroad during the winter season, by the Agricultural Societies through these townships, the beneficial effects would be *immense*. It is a system of instruction that is (on other subjects) in actual operation and favorably received; many would attend these lectures who would fall asleep over an agricultural treatise, and it would bring together and AGITATE on a most important topic the most enterprising of our agricultural youth.

For my part, after having for a season halted between two opinions, I am resolved to cultivate the paternal farm; but I am desirous of contributing my mite towards elevating the avocation to which I shall devote myself, and I wish to *begin at home* by IMPROVING MYSELF; for this purpose I solicit your assistance, which will be effectually afforded by your mentioning in an early number of the Agricultural Journal, what elementary works of scientific practical Agriculture are to be obtained in Montreal, and at what prices; by so doing, you will much oblige

A LATE SUBSCRIBER.

Eaton, April 30, 1849.

*To the Editor of the AGRICULTURAL JOURNAL.*

FLAX AND HEMP.

Your able correspondent "Rusticus" has, I am glad to see, favoured your readers in the last number of the Agricultural Journal, with one of his well written notices of this important article for Canada; since my communication, to which he refers, I have had occasion to look over Bouchette's valuable Topographical work on Canada, and was no less pleased than surprised to find in the appendix of the 1st volume some exceedingly interesting and really valuable information on the same subject, written as far back as 1828, under the title of "A brief inquiry into the probable causes that have counteracted the attempts hitherto made to introduce the cultivation of hemp in Lower Canada, and observations on the most effectual means by which its culture might be encouraged in the British North American Colonies generally."

At this period, when the situation of the country is in a much more advanced state than it was at the time of this publication, it may be highly useful to your readers, and to the Agricultural Society especially, were you to give insertion in your next number to the plan from Bouchette, for it appears to me that your Society could be made the channel through which the system there laid down could be carried out for the regular growth of hemp as an article of Commerce; and surely, Mr. Editor, the subject is of so much value to farmers and merchants that you will not refuse to publish the whole plan, so that your Society may be induced to take it up, or one similar to it, as a main object of their association.

A CANADIAN.

DEVONSHIRE OR CLOUTED CREAM.—This cream, and the butter made from it, are justly esteemed above all other in England. We have had it in Canada, equal, we believe, to any ever made in Devonshire. It is not by any means a very troublesome process, as all that is required is suitable apparatus for heating the milk, and due attention that it shall be sufficiently, but not over heated. We have heated the milk in tin pans upon an iron plate; but the following plan of heating the pans in water, we think the best and safest, as there will be no danger of burning the milk. The butter made from this cream is most superior, but we have never made use of it except as fresh butter. The Devonshire breed of cows, fed upon the pastures of that country, give very rich milk, and so we think would the native Canadian cows properly pastured. They keep a Guernsey cow to each ten or twelve Devon cows, and this is said to improve the milk and butter both in quality and appearance. To judge by the pastures we have in Canada, we could not expect that there is much value set upon the cattle or their produce, or the pastures would be sure to be improved:—

“The milk immediately it is drawn from the cow is strained into shallow pans, in each of which about half a pint of water has been previously placed, and in the winter the same

quantity of boiling water is used. The water is employed to prevent the milk from sticking to the pan, by which it would be burnt and thereby rendered useless for the manufacture of cream. It now remains undisturbed in the dairy 15 or 24 hours, according to the state of the weather. Thus in *sultry* weather the morning's milk is scalded in the evening, whereas, under ordinary circumstances, it would be retained until the following morning and done with the previous evening's milk. The process of “scalding” is performed by various means, generally over a small charcoal furnace, occasionally on a clear wood-fire, or by a warm bath. By the first plan the pans are placed on the iron-plate which covers the flue of the furnace, and moved slowly towards the fire so as *gradually* to increase the heat of the milk. This usually takes from 40 to 50 minutes; too much haste is a frequent cause of failure with persons unaccustomed to the practice. The period for removing the pan from the fire is indicated by the appearance of small bubbles under the “head” of cream, giving the surface a dimpled appearance. It takes place at the temperature of 180° Fahr., which is several degrees below the boiling-point, to which, if the heat should rise, the cream formed on the top is broken and the milk is spoiled for this purpose. When the milk is removed it is replaced in the dairy, and care taken to preserve the surface of cream unbroken. It is skimmed from 12 to 36 hours after, and the cream either sold in its present state or made into butter.

When the milk is scalded over a wood-fire the cream is liable to have a smoky flavour if by any chance the fire should not be perfectly clear. It is never followed in preference to other methods. The use of a water-bath for this operation is far from common; but as it is extensively used and is not only the *safest* but the *quickest* mode of procedure, I am induced to describe it. A flat boiler made of sheet-iron (2 feet wide, 7 feet long, and 1 foot in depth,) is fixed over a large flue in which rough brush-wood or furze is burnt. A quantity of *cold* water is placed in the boiler and three pans of milk are supported in it by means of rings, which increase in temperature with the water by which they are surrounded. It is evident that the heat is raised far more *gradually* than can possibly be effected by the most careful movement of the pan towards the fire. Another advantage which results from this method is *greater expedition*, which is very important in the summer months, as butter made from cream *slowly* formed will not keep so well as that made with a short exposure to heat. The extent of surface in the milk-pans produces a large “head” of cream; but the *depth of the milk in the pans and the firmness of the cream* increase in the same proportion. Six or eight quarts of milk is the quantity operated on in each pan, but in some dairies ten or twelve quarts are used. In general eight quarts

of milk will yield one pint of "scald or clouted cream."

The butter is quickly made from this cream by working the cream in a small tub by means of a stick, and is superior in every respect to raw cream butter. In those dairies where much butter is sold in barrels, they generally make it with equal quantities of raw and scald cream, being the most productive, obtained with the least expense, but inferior in quality. By the above process of "scalding" milk the butter is very completely removed in the cream, consequently the milk which remains is very poor and forms inferior cheese."

NOTES OF THE FIELD  
PARSNIPS AND OTHER ROOTS COMPARED WITH POTATOES.

Seeing the large quantity of ground under preparation for potatoes through the country, it is to be apprehended that too great a reliance may be again placed on this dangerous crop. I beg therefore to sound the alarm of the blight having already appeared in the forcing frames in "Anglesey" and "Carnarvonshire," and to recommend your readers not to neglect the cultivation of other green crops less affected by atmospheric injuries, and which may be of equal advantage in the profitable management of the farm.

"BOUSSINGAULT," who conducted his experiments both chemically in the laboratory, and practically by weighing animals, and noting the increase or decrease of weight produced by different descriptions of food, gives 28lbs. of potatoes as equal in nutritive value to 38lbs. carrots, 40lbs. of mangel-wurzel, and 67lbs of Swedish turnips. He does not appear to have been acquainted with the parsnip. I will, therefore, transcribe from the latest authorities in agricultural chemistry the most approved analyses of this and the other roots mentioned, and endeavour to ascertain the relative values produced by their cultivation.

Roots.	Water.	Starch.	Fibre.	Sugar.	Albumen.	Fat.	Gum.
Potatoes, ...	75.5	15.7	23.	33.	1.1	0.2	0.9
Parsnips,.....	79.4	Starch & fibre together 6.9		5.5	2.1	...	6.1
Carrots,.....	80.	9.		7.8	1.1	0.3	1.7
MANGELS.							
Long red,.....	85.1	...	3.	9.7	0.5	...	0.6
Orange globe,.....	86.5	...	2.4	10.2	0.4	...	0.1
Swede turnip,.....	89.	...	1.6	5.6	0.7	0.2	0.1

It would appear from the above table, that parsnips contain a greater quantity of albumen or flesh nutriment than the potato, and only 4 per cent. more water, and this analytical statement of their qualities is practically sustained by the details of their advantages in pig feeding, as given in my last. They require a stronger or more clayey soil than that suitable for the carrot, and, delighting in a moist subsoil (not saturated by springs), and a mild dropping summer, are peculiarly adapted for cultivation in the south of Ireland. The comparative value of the crops of the above mentioned roots may be ascertained pretty nearly as follows: An English acre of good potatoes will yield in this neighbourhood about 7½ tons; the nutritive equivalent of which in carrots, according to "BOUSSINGAULT'S" scale

Would be.....	tons.	cwt.
But an English acre of carrots will yield from 16 to 18 tons, say.....	10	4
<hr/>		
And we have a difference in favour of carrots, of	15	0
<hr/>		
The nutritive equivalent in mangel-wurzel would be.....	5	16
<hr/>		
But the produce of mangels may be taken at.....	10	14
<hr/>		
Showing an advantage in favour of mangels of.....	20	0
<hr/>		
The nutritive equivalent in Swedish turnips would be.....	9	6
<hr/>		
But the produce may be estimated at	18	0
<hr/>		
Showing an advantage in favour of Swedes of.....	20	0
<hr/>		
The nutritive equivalent of parsnips may be safely estimated, from both theory and practice, at	2	0
<hr/>		
35 to 28 of potatoes, or.....	9	7
<hr/>		
And the produce may be taken at from 16 to 18 tons, say.....	16	0
<hr/>		

Showing an advantage in favour of parsnips, of..... 6 13  
If the nutriment in the leaves of these plants was included in the calculation, the difference in their favour would appear still more considerable.

Though the mangel-wurzel seems to yield the greatest nutritive produce, yet, considering the firm, substantial character of the parsnip, the saving of fuel and attendance in its preparation for feeding purposes, and the peculiar advantage which it possesses over every other root vegetable in resisting the attacks of frost, from which it never suffers any injury, I consider it the most valuable green crop that can

be produced on the farm, and am now making every exertion to get a large breadth of it sowed before the end of the month.

Influenced by writers in the Agricultural Journals, who recommend the sowing of parsnip seed in the autumn, I sowed some in October last. It came up well, but the growth of the little plants being stopped by the cold of the winter, the larks, linnets, and other small birds have completely eaten them off the face of the field, and the ground is now in preparation for re-sowing.

Too little consideration is in general given by writers to the warfare of birds and insects with which farmers have to contend in the cultivation of their crops, and the result obtained by a person carefully directing and protecting the process of an experiment, is often found impossible to be realized in the practical working of the extensive operations of the open fields.

Considering the great depth (three feet in favourable subsoils) from whence the parsnip raises up, as it were from a mine, by its tap root, the materials from which the most valuable ingredients may be obtained (through the digestion of animals) for restoring to the soil the elements required for the growth of plants, I am disposed to recommend this root, particularly, to the immediate attention of your readers, and must not, therefore, forget to mention the following other advantages in its favour, in addition to those stated, viz. :—

1st—Milch cows fed on it give the richest milk, of the best flavour, those of Jersey and Guernsey wintered, on parsnips and hay, yielding butter of as fine a tinge, and nearly as good a flavour as when fed in pastures.

2nd—Horses thrive on it as well as on the carrot.

3rd—It yields much spirits by distillation.

4th—All poultry eat it readily when boiled; and

5th—Though potatoes, carrots and turnips are all taken from us with as little compunction as are the sly cuts of mutton from our pantries, I am not as yet aware of having any co-partners in the consumption of my parsnips.

Yours, &c.,

CHAS. BEAMISH.

Delacour Villa, 9th March, 1849.

P.S.—At Macroom fair on the 2nd inst., one of my pigs fed on raw parsnips sold for £6 11s. 3d. It was estimated to weigh about 3 cwt.—*Cork Constitution.*

SECRETS OF COMFORT.—Though sometimes small evils, like invisible insects, inflict pain, and a single hair may stop a vast machine, yet the chief secret of comfort lies, in not suffering trifles to vex one, and in prudently cultivating an undergrowth of small pleasures, since very few great ones are let on leases.

PAROCHIAL AGRICULTURAL SCHOOLS

SIR—Among the various means that may be used for spreading a knowledge of farming among the youth of the rising generation in Ireland, there is one to which, from its not having been referred to in any of the publications on that subject with which I am acquainted, I would wish to call your attention—namely, parochial agricultural schools.

For the establishment of a parochial agricultural school there is required little more than the consent of three parties, all of whom are to be found connected with every parish in Ireland—namely, the land proprietor, the parish priest, and the parson; of which parties the first mentioned can give a site for the school-house and the school-farm, and the two latter obtain from their several congregations (in cash, labour, building materials, &c.) the means of erecting the school-house and homestead, the property of which could be vested in trust in the parish priest and parish minister, and the church-wardens, or one of the parishioners named by the parish priest and parish minister. In each agricultural school-house there could be held two schools: one in the forenoon, and the other in the afternoon of each school-day.

The parish priest could be the patron of the morning school; the parish minister of the evening school, or *vice versa*.

The appointment of the school-master, and the management of each school, could rest entirely with the patron of it; but no school-master to be eligible who would not be qualified to instruct his scholars in the principles and practice of farming, as applicable to small holdings.

To the land proprietor would be reserved the right of choosing among the two school-masters appointed by the school patrons the one who would be entrusted with the occupation and management of the school-farm.

The time for literary, moral, or religious instruction in each school, to be three hours, and no more, on each school-day.

The time for the scholars' instruction in farming practice, to be at least two hours on each school-day; and to be, as far as the weather and season would permit it, intermeddiate between the forenoon and afternoon school hours; so that if the morning school opened at eight o'clock (as it might from Candlemas to Hallowe'entide), it would close at eleven, at which hour the farming practice could commence, and (there being half an hour for recreation, &c., at noon) would continue until half-past one, at which hour the afternoon school would open, to continue until half-past four.

In support of my opinion as to the space of three hours on each school-day being sufficient for the school-room education of the children of the peasantry, I take leave to quote you the words of Mr. Tremenhoe, one of her Majesty's inspectors of schools in England, on this interesting subject:—

“The farmer complains that the boys who have,



up to the age of twelve or thirteen, attended school regularly for six hours a day, is not so strong, and apt, and useful at his labour as the boy who has been habituated to it from a much earlier age. The objection is probably, in many cases, perfectly legitimate, and arises from the very confined scope of the instruction given, and the almost total abstinence from it of everything having a practical reference to the exigencies and employments of rural life. It is found that, under proper management, half the number of hours devoted to intellectual teaching can produce a development of mind and amount of acquirement, equal to all that can be demanded of the agricultural labourer, and far beyond what is now commonly attained by him; while appropriate industrial occupations, with which the rest of the time is engaged, train the hand and faculties to useful and skilful labour, cultivate habits of attention and regularity, improve the physical strength, and dispose the mind for renewal of exertion, by preventing its being continued during school-hours to the period of fatigue."

**CULTIVATION OF FLAX.**—"S., County Westmeath, writes thus:—"As linseed is much recommended for feeding cattle, and as Mr. Warnes finds that it is fully as efficacious if steeped in cold water as steamed or boiled (whereby fuel is saved), it becomes very desirable to recommend it to the small farmers in Ireland, to have each a small plot of it. I would ask you, therefore, to give short and clear directions for the treatment of land now, keeping in view the probable average condition of farmers' land at this season in Ireland, so as to enable them to sow American flax with advantage; also stating its subsequent treatment in all its stages." The most important point in the cultivation of flax is, that the land be thoroughly dry, and if not naturally so, should be rendered so artificially by thorough-draining. Next, the soil should be deepened and pulverized by subsoiling, and repeated diggings or ploughings (as the roots descend a great depth, having been found to penetrate to a depth exceeding a third of the length of the plant above ground), and thoroughly cleansed. The soil most suitable is a deep, rich, friable loam, after wheat or other corn, which has been preceded by a highly-manured green crop. The seed should be sown about the first week in April, at the rate of four bushels per Irish acre, if the crop is intended for fibre, but if intended for seed, it should be sown thin, at the rate of from two to two and a half bushels per acre. The Riga seed, or home-grown from Riga is best for fibre; but the New York is best for seed for cattle feeding. For saving seed, flax is a good crop to lay down ground with clover and grass seeds; but for growing the fibre for manufacturing purposes, flax should not be sown with clover and seeds, as the long growth of the clover and seeds spoils the stem, rendering it yellow, and devalued.

### PROFITS OF THE CARROT CROP.

SIR,—I wish to direct the attention of my neighbours to the profit of growing carrots, as the season for growing them is at hand, and I hope with your usual liberality, you will allow this a place in your truly useful paper. To farmers who keep a number of horses, I am convinced there are few crops more profitable. I beg to submit a statement of the profit and expenditure on 80 Irish perches, grown in the corner of a field last season, and I am enabled to do so the more correctly, as I bought the manure for the purpose.

	£	s.	d.	£	s.	d.
15 tons of carrots, at 30s. per ton.....				22	10	0
First ploughing in November, at 10s. per acre.....	0	5	0			
Digging in March, with the dung fork, ten men, at 10d. per day.....	0	8	4			
Two horses carting on the manure, at 2s. 2d.....	0	4	4			
Three women spreading do., at 6d.....	0	1	6			
Three hoeings and singling out during the season, 29 women, at 6d. per day....	0	14	0			
Twenty men digging in the manure and sowing, at 10d.	0	16	8			
Taking up, dressing and storing, 7 men, at 10d.....	0	5	10			
Ditto, 15 women, at 6d.....	0	7	6			
Seed, 2 lb., at 1s. 4d.....	0	2	8			
Manure bought.....	4	0	0			
Rent and taxes.....	0	15	0			
				8	1	4
Profit.....	£14	8	0			

I give a feed of carrots to the working horses every evening with chapped hay, thus saving a feed of oats for four or five months in the year, and to any person keeping a number of horses the gain will be apparent at once. I do not publish this for the purpose of showing that I have grown any thing like an extraordinary crop of carrots, as the soil on which they grew was not suited to their growth, nor is a great deal of the land in the neighbourhood well adapted for their growth, but to show that by adopting a good method and close attention, they can be grown with advantage on almost any kind of soil, and can be turned to account in many ways, particularly in feeding horses. I do not think I have put a high price, 2½d. per stone, one stone of which is a sufficient feed for a farm horse. My mode of growing, then, is in beds from four to five feet wide, and in rows across the beds sixteen inches asunder. Should this be the means of inducing a few of my neighbours to cultivate carrots, my labour will not be in vain.

On digging up the potatoes left in the ground at the digging season, I could see no difference in those from which the haulm were pulled from the others, except at November, that the tubers were smaller, see vol. 7, page 536, of the GAZETTE.—Yours, &c., WILLIAM KING, Land-steward, Woodstock, March 14, 1849.

INFLUENCE OF LIGHT ON PLANTS.

When a seed is committed to the ground it first effects, I may say, a mechanical change, produced by the swelling of the seed; this swelling is caused by the seed absorbing moisture, as is illustrated by steeping a few grains of barley in water, when the seed bursts its membranes, there extends in opposite directions two parts, one called the *radicle*, or future root, and the other the *plumula*, or future stem, and leaves. To support these growing parts the joint operation of heat and air are absolutely necessary; the starch and gluten contained in the seed supply the requisite food to the young germ or embryo for a time; but starch and gluten are insoluble substances, and no solid can enter into the circulation of a plant. How then is this change effected? Till lately chemistry was unable to unfold this mystery, but now she has triumphed, and informs us that just at the base of the germ, exactly where it is required, a substance *diastase* is produced, which has the power of rendering soluble those substances, converting the starch into sugar and gum, which minister, in conjunction with the transformed *gluten*, to support the *plumula* and *radicle*. Chemists have not, as yet, been enabled to examine properly the nature of *diastase*.

The young plant lives at the expense of the seed, until the roots and leaves are adequately developed so as to enable the plant to procure subsistence for itself, independent of that contained in the seed. This it does by its roots abstracting *earthy* and *saline* matter from the soil, carbonic acid and watery vapour from the atmosphere, by its leaves, both acting in their several capacities for the stability of the plant. But in many cases the plant does not exhaust the seed of all its starch before it penetrates the soil, or ascends into the atmosphere, as is exemplified in the case of the potato set; in a word, heat, moisture, and air, are the essential requisites for the growth of a plant in the early stages of its vegetation; this is shown by growing a few seeds on wet paper or cloth. The action of light retards the germination of seeds, and in many cases destroys them. It is a well known fact that seeds will not germinate unless free oxygen be present, as it is necessary for a portion of the carbon of the seed to combine with the oxygen, forming carbonic acid.

A wise provision no doubt exists on the part of nature, as regards the *radicle*. It receives

the major part of the substance contained in the seed, thus enabling it to send forth tender fibres, at the termination of which are placed *sparigoles*, which suck up *earthy* and *saline* matter, conveying it upwards for the growth of the stem and its dependants; and the leaves when expanded acting their part, by absorbing carbonic acid, which, by the action of sunlight, they are enabled to decompose, and assimilate to their structure; but if the light be *now* obstructed in its action upon the plant, it will either cease to exist, and grow weak and slender, as is observable where plants grow in the shade, or thickly together, because light is necessary, as I have before mentioned, to enable the plant to decompose its chief food, carbonic acid; and hence a diminutive supply of light is baneful.

From the above remarks I may justly draw this inference—that, before the embryo sends forth leaves into the air, light is injurious to its growth; but when the roots come into action they appropriate earthy matter to their growth, while, by this time the *plumula* is receiving the action of light.—Yours, &c., VECERO, Dublin, April 4, 1849.

**TURNIPS.**—The varieties of turnips usually grown are the Swedish, of different sorts; the yellow or Aberdeen; and the white globe. Of these the former is the most valuable, and it is sown from the middle to the end of May. After this the sowing of the yellow commences, and the globe variety last of all. Turnips ought invariably to be cultivated in drills, or in rows on beds, broadcast sowing being a waste of seed, labour, and land. The drills ought to be from 27 inches to 30 inches apart. A very common error is, making the drills too near each other, from a mistaken notion that the crop will be heavier; but this is not the case, for the heaviest crops will generally be found when the drills are not less than 27 inches apart.

The quantity of seed required to sow a statute acre, is about 3 lbs. It is very poor economy to be sparing of turnip seed, for by apparently saving a shilling an acre, the crop may be lost.

After the young plants have got into the rough leaf, they must be thinned to the proper distance between each plant; for Swedes this will be 12 inches, and for yellow and globe from 9 to 10 inches. Where turnip culture is understood, the thinning is invariably performed by the hand-hoe, pushing out the surplus plants, and only leaving those intended to remain; but in districts where turnip growing is only being introduced, it will be best to thin out the plants to the proper distances by the sand, and to stir and loosen the soil around and between the plants immediately afterwards with the hoe. At the same time it will be well to allow the girls who are employed in this work, to learn

the proper mode of doing it with the hoe, as when once they have acquired the proper manner of handling it, they will go over the ground in half the time they would do by any other means. The handles of the hoes ought not to be of such a length as we often see them; the girls will do more with hoes, the handles of which are only 2½ feet long, than with the handles a foot longer, and it is not uncommon to see them four or five feet long. Turnips ought not to have the earth gathered up about the roots like the potato; they ought to be left loose and bare, as the bulbs swell above ground.

Stirring the soil between the drills ought never to be neglected or delayed; upon the frequent and careful performance of this depends, in a great measure, the luxuriance of the crop. For this purpose the large farmer will use the single horse-grubber or horse-hoe, and the small farmer the fork or spade. All experienced green crop cultivators commence this process as soon as the plants in the rows are well defined, going over the field, and then beginning again and going on in this manner until the plants have got so luxuriant that the horse cannot walk between the drills without injuring the leaves. "The more you stir the more they grow," and no one need be afraid of "letting the drought into the land" by so doing, for turnips cultivated in this manner will grow much more quickly in very dry weather than if the soil is left untouched.

The crop ought to be removed from the ground in the early part of the winter, and stored up for preservation during the spring months. This is necessary, first to allow us to sow wheat after it, and next, because if the roots are allowed to remain until spring, they will run to seed, and thus the bulbs will be deteriorated and the land injured. In lifting them, the leaves and part of the tap-roots are cut off, but not too closely. The leaves may be given to young cattle, but sometimes they are strewed upon the ground, and ploughed in as green manure. The bulbs are stored in bins, six or seven feet wide at the bottom, sloping gradually to the top, and covered with a coating of thatch, but no earth. With this, as with other roots, it is necessary to turn the heaps over in spring, and to pick off the young sprouts. The white globe must be used first, as this variety does not keep so well during winter; next the yellow, and last of all the Swede.—*Farmer's Gazette*.

**MOST APPROVED MODE OF PREPARING BUTTER FOR THE LONDON MARKET.**—The churn should be as sweet and clean every time it is used as it was when new; and in winter, after being scalded, it should be allowed to cool to about blood heat, or something less than that. After the milk is drawn off the butter, the butter must be washed; but upon this process depends a great deal of the success of good butter for the

London market. If butter be much washed it weakens its body, injures its colour, and destroys its aroma; therefore we would recommend that butter should be washed first in a clean, fresh-made pickle, composed of about a pint of salt to three gallons of water, then let pieces of three or four pounds at a time be well worked with the wooden skimmer, or dish, until every drop of the buttermilk is expressed; but the hand must not touch it more than is absolutely necessary. The less handling butter has, the better; and yet, if the buttermilk be not entirely out of it, it will quickly turn the butter sour. After this first washing and expressing, let the butter be subjected a second time to a similar process, with a stronger pickle, made with four pints of salt, one ounce of saltpetre to three gallons of water, and expressed again. The finest rock-salt should be used, and the salt-petre should be pounded very fine, and mixed with the salt. The proportions for a firkin of butter of about 68 lb. nett butter, should be two and a half pints of salt and an ounce of saltpetre. At the fall of the year when butter becomes weaker in body, three pints of salt may be used. When butter is highly pressed into the cask, a piece of clean calico, steeped in pickle, should be spread over the top, to prevent any dirt getting to it when it should be securely headed. When sending butter, an invoice should be sent to the consignee, and the most scrupulous accuracy observed as to weights of the butter and tare, for if these be not correct, the dealer claims allowance for short weight, and account sales cannot be returned till the claim is investigated.

**ON THE MANAGEMENT OF FARM HORSES.**—If strong useful draught horses are required, the mares being selected with judgment, a stallion should be used possessing the following qualities as near as can be obtained: His head should be as small as the animal will admit; his nostrils expanded and muzzle fine; his eyes cheerful and prominent; his ears small, upright, and placed near together; his neck, rising out from between his shoulders with an easy tapering curve, must join gracefully to the head; his shoulders, being well thrown back, must also join into his neck (at what is called the points) unperceived, which perhaps facilitates the going much more than the narrow shoulder; the arm or fore thigh should be muscular, and, tapering from the shoulder, met with a fine, straight, sinewy, bony leg; the hoof circular and wide at the heel; his chest deep and full at the girth; his loin or fillet broad and straight, and body round; his hips or hucks by no means wide, but quarters long and tail set on so as to be nearly in the same straight line with the back; his thighs strong and muscular; his legs clean and fine boned; his leg bones not round but flat." In fact, as much goodness and strength as possible condensed in a little room.—*Farmer's Herald*.

THE USE OF LIME IN AGRICULTURE.

*How the chemical changes produced by Lime upon organic matter directly benefits vegetation.*—The reader may not inquire how all these interesting chemical changes in the organic matter, which attend upon the presence of lime in the soil, are directly useful to vegetation, and yet it may be useful shortly to answer the question.

1. Lime combines with the acid substances already existing in the soil, and thus promotes the decomposition of vegetable matter which those acid substances arrest. The further decompositions which ensue are attended at every step by the production either of gaseous compounds—such as carbonic acid and light carburetted hydrogen—which are more or less abundantly absorbed by the roots and leaves of plants, and thus help to feed them—or of other acid and other compounds, soluble in water, which, entering by the roots, bear into the circulation of the plant not only organic food, but that supply of lime also which healthy plants require.

2. The changes it induces upon substances in which nitrogen is present are still more obviously useful to vegetation. It sets ammonia free from the compounds in which it exists already formed, and promotes its slow conversion into nitric acid, by which the nitrogen is rendered more fixed in the soil. It disposes the nitrogen of more or less inert organic matter to assume the forms of ammonia and nitric acid, in which states experience has long shown that this element is directly favourable to the growth of plants. And—

3. It influences in an unknown degree, the nitrogen of the atmosphere to become fixed in larger proportion in the soil, in the forms of nitric acid and ammonia, than would otherwise be the case; and this it does both by the greater amount of decay or oxidation which it brings about in a given time, and by the *kind* of compounds which, under its influence, the organic matter is persuaded to form. The amount of nitrogenous food placed within reach of plants by this agency of lime will vary with the climate, with the nature of the soil, with its condition as to drainage, and with the more or less liberal and skilful manner in which it is farmed.

*Why lime should be kept near the surface.*—The considerations presented in the preceding sections suggest important reasons why lime should be kept near the surface of the soil, since—

1. The action of lime upon organic matter is almost nothing in the absence of air and moisture. If the lime sink, therefore, beyond the constant reach of fresh air, its efficacy is in a great degree lost.

2. But the agency of the light and heat of the sun, though I have not hitherto especially insisted upon their action, are scarcely less necessary to the full experience of the benefits which lime is capable of conferring. The light of the sun accelerates nearly all the chemical decompositions

that take place in the soil, while some it appears especially to promote. The warmth of the sun's rays may penetrate to some depth, but their light can only act upon the immediate surface of the soil. Hence the skilful agriculturist will endeavour, if possible, to keep some of his lime at least upon the very surface of his arable land. Perhaps this influence of light might ever be adduced as an argument in favor of the frequent application of lime in small doses, as a means of keeping a portion of it always within reach of the sun's rays; and this more especially on grass lands, to which mechanical means can with difficulty be applied for the purpose of bringing again to the surface the lime that has sunk.

There are, at the same time good reasons also why a portion of the lime should be diffused through the body of the soil, both for the purpose of combining with organic acids already existing there, and with the view of acting upon certain inorganic or mineral substances, which are either decidedly injurious, or, by the action of lime, may be rendered more wholesome to vegetation.

In order that this diffusion may be effected, and especially that lime may not be unnecessarily wasted where pains are taken by mechanical means to keep it near the surface, an efficient system of under-drainage should be carefully kept up. Where the rains that fall are allowed to flow off the surface of the land, they wash more lime away the more carefully it is kept among the upper soil; but where a free outlet is afforded to the waters beneath, they carry the lime with them as they sink towards the subsoil, and may have been robbed again of the greater part of it before they escape into the drains. Thus, on drained land the rains that fall aid lime in producing its beneficial effects, while in undrained land they in a greater or less degree counteract it.

**DRAINAGE OF LAND.**—Rivers and minor streams generally require attention before good and complete interior drainage can be effected; they fall exclusively within the province of adjoining land-owners. All works, with an intent of deepening, straightening, or otherwise improving the course of rivers, &c., should be executed under the *plans, sections, and specifications* of an engineering surveyor, in order to obtain every available advantage with economy and despatch. I advocate, after having been extensively engaged in the reconstruction of works of this character, according to the rule, a depth *nowhere* less than six feet below the surface of the ground, and of a width sufficient to keep goods below all other *improved* minor outfalls: this is the least expensive, and indeed the only practical means of increasing the general elevation of land which in truth is high or low, according to its relative position above its drainage outlet, whether immediately or indirectly connected by underground drains and ditches.

“Lands absolutely requiring drainage are all clays and peat mosses; and lands of every other

description whereon its produce cannot be consumed at any season without detriment to the stock feeding thereon, or without causing injury to present or subsequent produce."—*"Hutchinson's Practical Instructions on the Drainage of Land."*

The Irish Industrial Journal becomes rapidly in value and interest in each succeeding number. The leading article, by Sir Robert Kane, on the chemical phenomena of vegetation, from a forthcoming edition of his "Elements of Chemistry," cannot but be read with much interest and profit by those who are making, or have made, agriculture their study. We give the following extract:—

"In the seed of a plant the gem of the future individual is associated with one or more organs termed cotyledons, which contain, in general, starch and some form of azotized matter, as albumen, gluten, or legumine, which substances are so disposed in order to supply the nutriment necessary for the development of the embryo, until its organs are fitted for the collection of nutriment from external sources.

"The first act of growth in the seed is termed *germination*, and is accompanied by a remarkable change in the constitution of the cotyledonous mass. For perfect germination, it is necessary that the seed be moderately supplied with water and with air, and that it be either in the dark or exposed to but little light; all these circumstances are perfectly secured by the ordinary mode of sowing seeds in a moistened soil, which shall be so loose as to admit air, and yet exclude the light.

"A seed so circumstanced gradually swells to much beyond its original volume, and its temperature rises; it absorbs oxygen from the air, and envelops water and carbonic acid, and the starch of the cotyledon gradually disappears, being changed into sugar. From the point of the seed where the embryo is situated, two shoots spring forth, one of which, the *radicle*, takes its direction downwards into the soil, whilst the other, the *plumula*, strikes up towards the air, to become the origin of the stem; according as this growth proceeds, the quantity of sugar in the seed diminishes, and by the time that the radicle is fit for the performance of its functions, as root, in absorbing nutriment from the soil, nothing remains of the seed but its ligneous part, which in some cases completely perishes under ground, but in others rises, and assuming the functions of leaves (seed leaves), assists in providing nutriment for the young plants, until the stem shall have been furnished with leaves by which it may act upon the surrounding air.

"This process of germination is artificially produced, for the purposes of brewing, by the operation of *malting*; the grain is steeped in water, until it has absorbed the proper quantity of it; it is then spread on the floor of the malt-house, and its temperature prevented from rising too high,

by the mass being frequently spread out, and new surfaces exposed to the air. When the seed contains the maximum quantity of sugar—that is, when the conversion of the starch is most complete, and yet before much sugar has been assimilated by the germ, which is practically found to be when the radicle has grown as long as the grain, but does not project beyond it, the young plant is killed, by exposing the malted corn to a current of hot, dry air in the malt-kiln, and the malt is then employed as a source of sugar, in the fermentative process of the brewer and distiller.

"The saccharine fermentation, which thus furnishes nutriment for the young plant in the first stage of its existence, resembles the transformation of starch by means of sulphuric acid, and is excited by the presence of a peculiar ferment produced by the decomposition of the vegetable albumen which the seed contains. This active substance is termed *diatase*; it does not pre-exist in the seed, but is itself produced by the action of the air and water upon the albumen; it is not identical with the ferment which induces the alcoholic fermentation, yet they appear to be but successive stages of the decomposition of the same substance. The diatase may be obtained solid by bruising malt with a small quantity of water, and expressing the liquor; to this alcohol is to be added, which precipitates the quantity of unaltered albumen, and on evaporating the filtered liquor to dryness, the diatase remains, though by no means pure; it is a white, gummy mass; it is precipitated by infusion of galls, and most metallic salts, one part of it rapidly and completely converts a solution in water of 2,000 parts of starch, first into dextrine, and finally into grape sugar. It has been suggested by Saussure, that diatase is identical with the substance termed mucid, but this is doubtful; it contains nitrogen, and is most probably, as already stated, the first product of the putrefaction of the gluten or albumen.

"When the process of germination is over, the plant is found provided, by its roots and leaves, with the means of procuring such nutriment as its future offices require, from the atmosphere and the soil. For the constitution of its proper ligneous tissue, carbon, hydrogen, and oxygen are required, and these serve also for the formation of the majority of its excreted products, as sugar, gum, starch, resin, oils, and acids; but, in addition, nitrogen is required; and although the proportion of nitrogen in any plant is small, compared with that of the other elements, yet it is of great importance as a constituent of the active principles of most medicinal plants, as the vegetable alkalies, amygdaline, &c.; and of still higher interest, as Bousingault has shown, the nutritive power of each plant, when used as food, to be proportioned to the quantity of nitrogen and phosphates which it contains. In every plant there exists also certain inorganic elements, acids, and bases, which though small in quantity, are

yet essential to its healthy growth. The examination of the mode, chemical and vital, by which these various substances are supplied to the plant, and assimilated by its organs, constitutes an important branch of vegetable physiology, which can here be but superficially sketched; and, in its relation to practice, the manner of supplying these materials so as to favour the growth of plants, and develop their most useful principles, must be the basis of every system of enlightened agriculture."—*Farmer's Gazette*.

The business that specially took me to that country this week, was to sell the stock and farming implements of an English farmer who farmed, for the last twenty years, 130 acres of land close by the demesne of Loughglynn, the seat of Lord Dillon, four miles from the town of Castlerea. This true specimen of English farmers took that land twenty years ago, grown over with weeds impoverished by burning, con-acres, &c.; and on an old map of the place, the ditches resembled a lot of wounded serpents indiscriminately crawling in their curvy motion, through couch-grass, thistles, and rag-weed; bleak and exposed to the westerly storms on the one side, and the nipping northern blight and easterly winds on the others; the soothing sunshine and gentle shower of the south were stultified into barrenness. The soil, from repeated bad usage, had become little better than the subsoil on which it rested—adhesive from poverty, and, consequently, of retentive quality.

The skill, industry, and prudent application of capital, on the part of that good English farmer, have, in due time, had their effect in changing fenceless, crooked mounds into straight hawthorn hedges, of full growth—the barren, weedy soil into feeding land for heifers and weathers—the retentive portions of soil and subsoil pulverized and drained—the wild waste in beautifully divided fields, in perfect proportion—the bleak, wild blast that furnished the animal heretofore, arrested on every side by the thickly-grown fence—the burning and stripping of con-acre turned into a rotation system, wisely reserving a proportion of the oldest green skin to prepare the fat sheep and heifer in summer for the turnips in winter, and all so perfectly in keeping with each other, that an equal number of stock is kept up, winter and summer, wallowing in the luxuries of the farm. All the time that the good man has been doing this, he paid 30s. per acre, and a fine, in the good times, of £250 for a lease. Times are now so altered, by increased taxation, and reduction in the price of the produce, that, after making this perfect MODEL FARM, for such it truly is, the good man is about to resign his interest, leave the farm behind him, and return to England, except he gets a very considerable reduction in rent, to save him from the loss of his capital.—*ib.*

**TILLAGE.**—It will be generally admitted, that not only may the introduction of a green crop in a proper rotation be serviceable in adapting particular particles of soil to particular plants, but in contributing to the proper pulverization and cleaning of the land. This, however, cannot of itself be so effective as to exclude the further use of the drill system, as invented and practised by Mr. Tull, and by which he did such wonders. The use of the drill system is two-fold; first, by depositing the seed to a certain depth and with great regularity, each seed has a better chance of vegetating, and the plant from it, having a given space is more likely to gain strength and fullness of ear; second, by the stirring of the soil betwixt the rows, looseness and friability of mould is obtained, by which all the small fibres of plants can luxuriate and extend with more ease. Mr. M'Arthur, on the roots of plants, states ("New Husbandry," p. 55) "that he has traced the roots of Clover (the latter less than six month's growth) to the depth of three feet; and the roots of turnips, those which grew straight down, two feet, the lateral ones four feet from their bulbs; and that he has found turnip roots or main fibres, in a favourable soil, grow half an inch daily, from the time sown, for three or four months. Drills three feet wide, and ten inches between the plants will be sufficient space. This will produce 30 to 60 tons to the acre; but 100 tons at least is the smallest quantity which all should endeavor to raise." If such can be the effects of tillage on a bulbous root, what may it not also be on a white crop? It has been too much the custom, it is still too much the custom, to suppose that a green crop cures all ills, that a foul broadcast medley may then ensue. But why is not a corn crop to be kept just as clean, the soil to be made as friable, the same depth of pulverization to be going on as for a green crop? A slovenly practice, a contracted expediency, the absence of proper implements, must be the only cause for such a contingency. Any one who has inspected Dr. Davis's Springpark farm would find that, although he has not grown wheat on the same land for twelve years running, like Mr. Tull, and although he has not raised his fine crops without manure, yet much less of this is used there than is common in most farming, the dunged crop only coming round once in five years. Here to a certain degree deep and effective tillage is made to supply the place of manure. There is no excuse in the present day for the tillage system not being properly carried out, the facilities for it being so great, from the new and ingenious implements which have been invented, so much superior to the rude one invented by Mr. Tull, the idea of which he took from the barrel of an organ. Mr. Garret's drill, of which a description is given in the "New Husbandry," p. 174, is a most effective implement; it will deposit the seed at any distance required, in such a

quantity as is wanted. His expanding horse-hoe is adapted to the machine, and will cut the soil and the weeds under the surface, with the rows at different distances. I have sown this last year, with the 14 inches apart, and some 9 inches, the quantity of seed being  $1\frac{1}{2}$  bushel in part, and the other intended to be 1 bushel, but which appears too thick and requires being thinned. Mr. Davis inspected some wheat which had been transplanted, and was grown from one peck of seed, estimated from 30 to 40 quarters per acre. He began, himself, by having one of Mr. Garrett's horse-hoes, and he has now got five. But there is another implement very highly spoken of, invented by Dr. Newington, which is said to dibble the seed with still greater regularity than the drill, may be managed by one person by hand, and costs only about £5 instead of the £50 which is the price of Mr. Garrett's, and £16 for his horse-hoe. Of this very promising implement, I cannot speak from my own knowledge, but I hope to do so another year, and to have one myself. A man, it is said, may dibble with it half an acre a-day at a proper distance.—*Law. Rawstorne, Penwortham, Preston.*

ON THE MANGOLD WURTZEL.—The culture of the land for beet does not differ from that of the potato; and it is only necessary to enunciate, in a summary manner, our mode of management. The stubbles will be subsoil-ploughed early in autumn, and in spring the most minute attention must be directed to its perfect pulverization and cleaning. These processes should be accomplished by the first of May, and the land at once ridged up in drills twenty-seven inches wide. Our reasons for adhering to this width in every case for fallow crops, are, that the distance really admits the dung carts without destroying the ridges, and is perfectly suited to the complete action of the horse-hoe in summer cleaning; besides that it affords full space for the development of the leaves, which last circumstance we believe to be of very high importance.

The dung most suited for this crop is a mixture of animal and vegetable matter, which should be applied in a well decomposed state, at the rate of from thirty to forty tons per acre. It must be immediately spread out in a regular manner, and speedily covered by reversing the ridge. A light (curved) roller is then to pass over them lengthwise, to smooth and consolidate their surface. The seeds will now be put in, and it will be found that the dibber will most correctly perform the operation, in which process five or six women will finish an acre per day. The dibber which we have found effectual for the purpose was of the common form, and nine inches in length, with a thick point and a cross piece of wood fixed two inches from the point, to prevent the seed from being inserted

deeper—the seed requiring that depth of earth, but not vegetating at a greater distance from the surface. The length of the dibber is a guide to the distance between the plants, and will always check the operator in that respect. The women carry the seeds in their aprons, and deposit three or four in each hole along the centre of the ridge, slightly covering them with the point of the dibber. The roller again passing over the drills, finishes the operation of planting. Four or five pounds of seed will be required per acre by this mode, but if sown in a running drill, double the quantity of seed will be found necessary. Another advantage in using the dibber is, that the seeds are deposited exactly where they are wanted, and less expense or risk in thinning is the consequence.

In a few days after the plants appear, the horse-hoe and hand-hoe must be set to work, and continued till perfect cleaning is effected, great care being necessary not to wound the plants, as if they are once injured, they seldom recover their full vigour. We do not approve of earthing up this crop, as it tends to prevent the roots from swelling out to their full size, and it is the nature of this plant to form a considerable portion of its bulk above ground.

Great care is necessary in ordering the seeds—for if an admixture, casual or fraudulent, of the garden or other small sorts be sown, a serious loss in weight of crop will result—and seed of more than one year old will vegetate freely. Before concluding this part of our subject, we may briefly state that, to ensure confidence in the result, not only this seed, but that of the turnip, should, where practicable, be raised on the farm. In the case of this plant, the operations of seed growing are very simple. Select a portion of the largest and finest roots, and in spring plant them out in rows about thirty inches distant, and from plant to plant fifteen inches; keep them free from weeds, and protect their seeds from the depredation of birds as they ripen. The spot selected for growing seed must be as far as possible from the kitchen garden, cottagers' gardens, or any place where the garden beet is cultivated. When the crop is ripe, cut it over, and a few days of good weather will dry it enough for thrashing out, after which it may be preserved in a dry loft till required for sowing.

When the mangold wurtzel has done growing, the tops may be cut off and given to cattle and sheep, both of which devour them greedily; but care must be taken not to injure the roots; if these are cut or bruised at any stage of their growth, or after being stored, the rich juice exudes, and the value is generally lessened. The crop must be stored before severe frost comes on, and may be either pitted or preserved in a root-house; but excessive quantities must not be laid together, as they would be liable to fermentation, and subsequent rotteness; but if common attention is paid, the root may be pre-

served till the end of June, if necessary, without perceptibly losing any of its useful qualities.

In feeding beasts on mangold-wurzel, it may be assumed as a safe general rule, to allow alternate rations of beet and turnip. But milch cows must form an exception. To this portion of the stock, so important to the community, we would allow no turnips under our system; this suggestion will be startling to many of our neighbours, including the cow-feeders, but a sufficient reason will be found in the undeniable fact, that a most disagreeable flavour is generally imparted to the dairy produce by the use of the turnip; while in the milk, cream, and butter from cows fed plentifully on good mangold-wurzel, the taste and quality is little, if at all, inferior to that from the "milky mothers" fed on the finest meadow grass of the south.—*Scottish Agricultural Journal*.

#### LARNE MODEL FARM.

Sir—In the *Farmer's Gazette* of the 20th ultimo, "A Tipperary Correspondent," inquires how the stock on the Model Farm is supported, and in reply, I feel much pleasure in laying before him and the public an outline of the management of the stock, and also of the course of cropping pursued at the Model Farm.

When the farm, which contains 7 acres, 1 rood, 3 perches, statute measure, was taken into connection with the Larne National Schools, it was so wet and weedy that it required great energy and a considerable outlay of capital to bring it into a profitable state for cultivation. Three-fourths of it were thorough drained with tiles and stones, and a part of it trenched twenty inches deep. It was worked on a five course shift, as being best adapted to the state of the soil; and altogether so skilfully and carefully managed by my predecessor, Mr. Donaghy, now of the Model Farm, at Glasnevin, whose zeal and efficiency in the promotion of agricultural knowledge so well qualify him for the situation which he now holds, that in the course of a few years he was able to raise so much as 68 tons of turnips to the Irish acre, and almost invariably upwards of two tons of wheat to the acre.

The rotation is being changed this year into a three-course, and a four-course shift, being considered more profitable than a five-course, in the present state of the soil. The crops last year were as follows:—One fifth under potatoes, turnips, mangels, cabbages, carrots, and parsnips; one-fifth under oats: one-fifth under grass, the second year; one-fifth under grass, the first year; one fifth under wheat, laid down with grass.

The field intended for green crops was ploughed early in the autumn, immediately after the oats were removed; it was ploughed again in the spring, as soon as the state of the weather permitted, and afterwards dug as deeply as pos-

sible with a common spade. The ground was then divided into plots suited to the different crops, the deepest soil being appropriated to the deep-rooted plants. The mangel was planted in drills made across the plot. The method adopted was as follows:—

Part of the surface soil was removed from the place intended for the first drill; the remaining part of the surface soil, and also part of the sub-soil were made as loose as possible with a three-pronged fork, about nine inches long; the manure was then deposited, and covered with earth removed from the place of the second drill; the second drill was made similar to the first, and the manure covered with earth from the place of third drill, &c. The seed was steeped for forty-eight hours in dilute urine, and dried with powdered lime previous to sowing.

The sowing was performed as follows:—Small holes were made in the top of each drill, with a common hoe, about 1½ inches deep, and 14 inches asunder; in each hole four or five seeds were dropped, and these covered with fine earth out of the bottom of the drill. Two plants were allowed to grow in each hole till about the first week in July, the object of which was to prevent any loss being sustained from any of the plants running to seed. The leaves were taken off at three different times, and though the growth of the plants must have been more or less retarded in consequence, still we had a fair crop—viz., 60 tons of roots to the Irish acre. I am determined to plant two-thirds of green crop field with mangel this year, as it appears to be a more valuable crop than turnips. The growth of the young plants is not so precarious as that of the turnip; the leaves enable the small farmer to keep his pigs in a thriving condition during the summer and autumn. The produce will be greater than that of the turnips; it gives no unpleasant taste to milk or butter, and its nutritious properties are greater than those of the turnip. The turnip-drills were 28 inches apart, and the plants in the drills 12 inches. The produce was 47 tons to the Irish acre.

Immediately after the winter vetches were removed, which was about the first week in July, the ground was dug up, and planted with drumhead and flat Dutch cabbage plants; the drills were two feet apart, and the plants in the grills were 18 inches. The manure applied was a mixture of farm-yard dung and sea-weed, in equal quantities. The weight of the crop on the 1st of November was 52 tons to the Irish acre. I may here remark, that the cabbage seeds were sown in the second week of March.

The wheat on the Model Farm was sown on the 16th of February, after turnips; one half the ground was drilled, and the other half sown broadcast. The drilled was much better than the other; it ripened earlier, and more evenly; the straw was firmer, and the ears better filled. The superiority of the clover sown on the drill-



ed, over that on the broadcast part is very striking; it is longer, healthier, more luxuriant, and promises to repay amply the cost of drilling. The produce of wheat was only 39 cwt. to the Irish acre, last season being very unfavourable for the growth of the wheat crop.

## Agricultural Journal

AND

TRANSACTIONS

OF THE

LOWER CANADA AGRICULTURAL SOCIETY.

MONTREAL, JUNE, 1849.

NOTICE.—The Quarterly Meeting of the Directors of the Lower Canada Agricultural Society will take place at their Rooms, in this city, on Friday, the 22nd of June, instant, at 11 o'clock, A. M.

By order,

WM. EVANS, Secy,  
L. C. A. S.

June 1, 1849.

### AGRICULTURAL REPORT FOR MAY.

The greater part of month of May was far from favourable for the springsowing and planting, and up to the 26th there were few fine warm days. We had frost several nights and also cold rains, which retarded the sowing considerably on clay and flat lands. Vegetation is consequently, very backward, and much of the spring work yet unfinished. We do not recollect to have seen so generally low a temperature during the month of May as this year, and indeed both April and May were unusually cold and unpleasant throughout. We are glad to perceive that the meadows, unless when very wet, do not appear to have any of the grass plants winter killed, but we believe that many lands seeded down last year are very short of plant, and will require seeding again. We can see distinctly this spring the great advantage of having meadows deeply covered with snow during winter. The spots that have

been so protected from the cold, look much better, and more beautifully green, than where the ground was bare. The last winter must have been exceedingly unfavourable for fall sown wheat in Eastern Canada, but we suppose very little has been sown. We should not, however, give up the hope of being able to grow a hardy variety of fall wheat here, by proper cultivation, and sowing early. Except where the soil has been insufficiently drained, it may have been possible to put in most of the seed during the month of May, and where due exertion has been made, there will not be much of the sowing or planting to do after the last of the month, with the exception of turnips and buck-wheat, which may be sown throughout the month of June, and the former to the middle of July. We stated some time ago, a method adopted by some farmers in England in sowing turnips to preserve them from the fly—that is, sowing a row of rye or barley between the drills of turnips some time previous to sowing the latter so that the farmer might have attained some height of plant before the turnips were over ground. The young plants of barley and rye are said to protect the turnips from the fly. Another method recommended is, sowing mustard seed in rows, or corners of the turnip field, sufficient time before the turnips that the mustard shall be in full leaf before the turnips come up, thus providing food for the fly which they prefer to the turnip plant, and will not prey upon the latter while they have the mustard plants. Steeping the seed previous to sowing in train-oil, and drying it in flour of sulphur, is also recommended as a means to save the turnip plants from the fly. We have steeped the seed in a strong decoction of tobacco with good effect. In making use of steepers, the great point is, that the seed be as quickly as possible pushed forward into the rough leaf, by stimulating manure. It is a great advantage to turnips to have their growth very rapid in the commencement until they are safe from their great enemy, the fly. We believe a large quantity of wheat will have been

sown this year, and we have seldom seen a poorer sample of seed, so far as regards the size of the grain, than what has come under our notice this year. It has become necessary that we should have new samples of wheat imported. The expense of doing so would be amply compensated to the country, although it may be difficult to convince "*the country*" that it would be their interest to import this seed for the people. The expense to a private individual of importing new seeds is too great to be incurred by most people, and under our peculiar circumstances. "The country" or public Societies should import these things. If we could only see the seeds that are produced from superior husbandry in the British Isles it would give farmers an idea how inferior their system must be to produce such samples as we do in this country. It is said that the Temperance movement in Canada will prevent much barley being sown this year. Although it might not be manufactured into beer, it is an excellent grain to employ for feeding beef and pork, and we would recommend farmers not to give up its cultivation, as it is a suitable grain for our soil and climate. Oats is also said to be less extensively sown from the low price of the grain, but we may grow oats to a great extent and consume it all upon the farm to great advantage in feeding cattle. It has been proved that giving one lb. of ground oats daily to a calf for the first year, will pay better than any other way it can be applied, and we have no doubt of it. The cost of providing calves with this quantity of ground oats for a year would not exceed ten bushels, and would repay the farmer amply, provided the animals were to be maintained subsequently in good condition, and always kept in a progressive state of improvement. Farmers will require to apply all their talent and industry now to make a living. Products will have to be raised that will sell, and if the prices are low, the additional quantity will make up for this. Farmers must recollect, however, that it will be useless to raise surplus produce that will not meet a

ready sale, unless it be to manufacture into an article that will be sure of sale. The only possible means of contending successfully with the present difficulties is by the judicious improvement of our agriculture, so as to augment greatly its *saleable* produce. Farmers who are settled upon the lands of the country, should not allow any circumstances to divert them from what must always be clearly their interest,—namely, the improvement of their farms and cattle. To go on steadily, in the accomplishment of this object, will be good for themselves, and for the community under every circumstance that may occur. There is not anything of so much importance to Canada, as to have her lands better cultivated, producing better crops, and having a better stock of cattle. The present spring has been the most ungenial of any we have known in this country. The land was constantly in a bad state of work. Where we have no thorough draining, in such a season as this, the soil was no sooner dry than it was wet again before it could be sown. No doubt land has been sown, but we are persuaded that it was not all in the best condition for the harrow, and could not be. The proof of sufficient draining in England is—that the soil is fit to work in twelve hours after heavy rain. In Canada, it requires several days to dry the soil after heavy rain, before it is fit to work. We have much to be done here before we can farm to the best advantage, and in all seasons. This may yet turn out a favourable season, but so far, certainly, the weather was not the most suitable for sowing, or for executing the work as it ought to be. There is not any material alteration in the price of agricultural produce since our last Report. Cattle have still to be fed in the house or yard, but under a more perfect system of farming this would not be so injuriously felt, when a full supply of food would be provided for stock; until this is the case, however, a cold, ungenial spring must be very disadvantageous to farmers who may not be properly prepared for it, and their cattle must consequently suffer.

May, 1849.

We beg to acknowledge from the New York State Agricultural Society, an invitation to the great Annual Show and Fair of that Society, which is to take place at Syracuse in September next, and also an invitation to the Lower Canada Agricultural Society, to send delegates to the meeting. We have no doubt that the Canadian Society will, with pleasure, send delegates to the meeting; and, for our own part, if circumstances will admit, nothing would afford us more satisfaction than to be present at a meeting that must be extremely interesting to all friends of agriculture. To the Secretary of the New York State Agricultural Society, B. P. Johnson, Esq., we offer our best thanks for his kindness in sending us several interesting papers, and his obliging communications, whenever we have had occasion to address him respecting agricultural matters. A friendly correspondence between Agricultural Societies is most essential to their useful working for the general good of the human race, and the New York State Agricultural Society are entitled to the greatest praise for their friendly disposition to the advancement of agricultural improvement in foreign countries as well as in their own.

The Secretary of Highland and Agricultural Society of Scotland, John Hall Maxwell, Esq., has very kindly sent us a complete copy of the transactions of that Society from 1843 to 1849, being the new series, and consisting of twenty-four quarterly numbers neatly covered, and containing most useful and interesting information on the subject of agricultural improvement. This work makes a valuable addition to the library of the Lower Canada Agricultural Society, for which they beg to offer their best thanks. The Canadian Society may, at some future period, be able to send the Highland Society a publication that will be better worthy of their acceptance than this Journal. For the present, they are merely able to make a commencement, and find a considerable difficulty in doing this. We can assure our friends in Scotland that it is not because agriculture in

Canada is in a high state of improvement and prosperity, that the Lower Canada Agricultural Society is not adequately supported—the fact being exactly the contrary. The most intelligent and active Agricultural Society in the British dominions would find ample scope for all they could possibly effect in the way of improvement in Canadian Agriculture. What we require is to understand perfectly the defective state of our agriculture, and what are the improvements it is capable of? This would appear a very easy affair; but, nevertheless, farmers will not be convinced on the subject, or come to any conclusion, as to whether their system of husbandry is a good or a bad one, and the produce from it ample, or not a fourth of what it might be. In every country it must be the fault of the farmers when Agricultural Societies do not produce much good to agriculture. Such Societies are organized for the benefit of farmers, and if supported properly, they cannot fail to be beneficial to them, particularly if their object be the *general* improvement of agriculture, and their funds applied to the carrying out of this upon a judicious plan.

The necessary attention is not given to the breeding of cattle and sheep in this country. It is impossible to have a valuable breed of either without careful selection, and not allowing the inferior animals to breed, but to fatten them for the butcher. When a farmer has once got a select stock of good animals, there may not be any necessity to prevent all the females from breeding, but the stock the farmers in general have at present are very unsuitable to breed from without careful selection. Until we adopt this plan, our cattle and sheep will become more inferior every year. There is much care necessary to carry out this system, because the farmer cannot allow all his cattle to feed together, and bulls and rams run out at large. All the males not intended to breed from should be changed when young, and those chosen for breed should be separated until required, and then only allowed to go with the

females selected for breeding. While we allow all our stock to run together, as at present, and breed at any age, it is out of the question to have a choice or valuable stock of any species. The confinement of the males *constantly* is the only remedy that appears to be in our power, as there would be considerable difficulty in keeping the other stock separated, with the present general state of fencing.

There are some well managed farms in Lower Canada that produce excellent crops, and have a good stock of neat cattle and sheep, but the best of them are not to be compared to some English farms as regard thorough draining—regular rotations—superior cultivation and crops—*fine stock* of all varieties—beautiful meadows and pastures—the best and most suitable implements that can be made for every work upon a farm, and men and boys perfectly trained to use them expertly. Indeed there cannot be anything more delightful than to see a well managed farm in the British Isles, where every branch of husbandry is conducted in the best style, and where the best of crops and of cattle result from this good management. It is only those who have been so fortunate as to have seen such establishments that can correctly understand how very defective is the general system of husbandry in this country. Our crops are deficient—our cattle and sheep are inferior—and the produce of our dairies is half wasted by mismanagement. This is actually the state of our agriculture at this moment. The question naturally occurs—what is the cause of this? does it arise from any defect in our soil or climate that our agriculture is not in a more flourishing condition? We cannot admit that our soil or climate would prevent our adopting a better and more profitable system of husbandry, because we have sufficient proof in practical operation that improved husbandry may be successfully carried on here. We do not hesitate to say that it would be impossible to confer a greater benefit upon the rural population of Canada than to convince

them that it would be for their interest to introduce an improved system of agriculture, and to instruct them in this system. The advantages that would result from this would not be confined to the rural population, but would benefit every class of the community. We might as reasonably expect that we could live and prosper upon the products of the United States as to expect that the population of Canada can be prosperous from any other source but the products of her own soil. The best friends that Canada will ever have will be those who promote the improvement of her agriculture, and thus securing to her population the means of providing for their comfort and happiness from resources which they cannot be deprived of. There can no mistake or deception in promoting the improvement of Agriculture, and this is more than can be said of most other speculations. If we had not been firmly persuaded of this fact, we should have long since ceased to advocate it. Men may form a false estimate of the importance of other things, but it is impossible to estimate too highly the importance of an improved and prosperous agriculture to all classes of the Canadian population.

Suitable implements are necessary for improved husbandry. Without these, there are many works upon the farm that cannot be executed properly or expeditiously. In this country few farms are supplied with that variety of good implements that are required in a good system of husbandry. In England, they possess every advantage in this respect. There is not on earth a better or greater variety of agricultural implements than in England, or more skilful hands to use them, at every work upon a farm. This is an advantage to farmers, of which we are in a great measure deprived, and is a loss to an amount that we are not aware of. All these matters are of great consequence, and in proportion as they are considered so, will be the probable advancement in agricultural improvement. It is on model farms that im-

proved implements can be best recommended to farmers. On such establishments every variety should be in use that would be required in a perfect system of agriculture. Young men under a course of instruction would thus learn their use and how to use them. Visitors to model farms would see them in use and understand their utility and value. We have written much in recommendation of model farms as a certain means of improving Canadian Agriculture; but as there is no action being taken to introduce such establishments, we must conclude that this improvement is not considered as a matter of any general importance, except to those actually engaged in agriculture, who may be allowed to help themselves or let it alone, as they think proper.

We perceive, by exchange papers, the great difference of prices paid for salt butter in the English market, varying from 40s. to 120s. the cwt., and this is solely owing to the difference of quality, and this difference of quality is the consequence of mismanagement of the milk, and unsuitable dairies. We suppose that some of the butter shipped from Canada does not sell for more than half the price that other portions of it sell for, and this inequality in prices is certainly attributable to the inferior quality of part of what is exported. There is no necessity that it should be so, as our milk is the very best. All we require is that we have good dairies, and the milk managed as it ought in every way. There will be no uniform quality of butter, while there is no regular and uniform system of managing the milk and making the butter. There is only one way of doing it well, so far as regards the temperature of the dairy, and the making and salting the butter. In a well managed dairy, during the summer particularly, there should be no bad butter, and when there is, it must be from want of skill, or mismanagement in some way. The milk in general comes naturally good into the dairy-woman's hands, and it is her fault when she does not make good butter and cheese of

it, if her dairy is clean, of proper temperature, and supplied with suitable implements. The mixed quality of butter brought to market for sale is a fair indication of the general state of agriculture. There is some of excellent quality, while a considerable portion is what is termed grease, only fit for machinery.

“Believing in the sound Agricultural doctrine, that stock follows subsistence, and that improvement invariably takes place in the former, in proportion to the increase of the latter, the members of the Society have, for the present, determined to discontinue most of the premiums for cattle, intending, in future, to apply their best energies, and the whole of their funds, to the amelioration of the soil by draining—a more enlarged cultivation of green crops—a more strict cultivation to correct and tasteful management of every farming operation, and a total abandonment of the old *catch-crop* system.” We fully concur in the above extract from a report of one of the Irish Agricultural Societies. We have always recommended that the improvement of the land and its cultivation should be the first and principal object with all Agricultural Societies, convinced that the improvement of cattle and sheep will be sure to follow improved cultivation of the soil.

We perfectly agree with the ideas of “A late Subscriber,” and feel satisfied that the improvement of our agriculture would be of infinitely more importance to the country than any political question that has or does now occupy public attention; but, unfortunately, all that “A late Subscriber” or we could write would not convince others of this fact. There are not many of the best agricultural works to be purchased in Montreal, unless they are expressly ordered. Thaer's Agriculture is an excellent work for a beginner; so are Low's and Sproul's Agriculture. Shaw and Johnson's Encyclopaedia is a good work. The Farmers' Friend, published in 1847, is all that the title would indicate. Stephens' Book of the Farm

is a good practical work. We shall return to this subject in our next.

The suggestion of our correspondent, "Canadian," shall be attended to in our next number. The subject is one of too much importance to the country to be neglected by us.

The prosperous state of agriculture in Scotland, and the extraordinary improvement of the lands in that country, has been attributed chiefly to the Scotch system of banking, affording easy and constant accommodation to any parties able to find security by what are called "*cash credits*," being the only banking accommodation suitable for the agriculturist. The following letter, which we copy from the Dublin Farmers' Gazette, we conceive to be as applicable to the situation and circumstances of Canadian farmers as to those of Ireland. In Canada, where farmers are generally proprietors of the soil, we think the Scotch system of banking would be a safe and exceedingly beneficial mode of accommodation, and would be productive of immense improvement in agriculture, as capital is an essential requisite in a perfect system of husbandry:—

SIR,—There is no question of more vital importance to the citizens of Dublin and to society at large, than that of obtaining proper banking accommodation, and yet by a strange fatality, there is no question which has been more completely overlooked, both by the press and the public, although the want of proper banking accommodation is one of the main causes which hurries us on each year nearer and more near to utter bankruptcy and ruin.

Why is this so? Why is the press thus silent on a question of such vital importance to the public welfare? Why are our merchants, our manufacturers, our traders, and all those whose livelihood depends upon the industrial prosperity of our country—why are all these thus silent on a subject which so nearly concerns them, when each year which passes shows more clearly the fruit of that silence in the decay of our trade, manufactures and commerce, and in the expatriation from our shores of such large numbers of skilled artizans, who, for want of encouragement in their native land, are driven to seek elsewhere that employment which it is in vain for them to expect in Ireland.

This should not be so, and I respectfully submit it is the imperative duty of the press to concentrate public attention on the consideration of this most vital question.

Of what use is it to fill your columns with exquisitely written dissertations on the vast undeveloped resources of this country? To tell us of our mines, our minerals, our immense water-power, flowing uselessly away, of the exhaustless riches of our deep sea fisheries, or of the extraordinary fertility of our soil, if properly cultivated?

To what purpose tell all this, except to add an additional pang to those we already writhe under, by tantalizing our gaze with the sight of riches we may not enjoy, unless you will, at the same time, show us how we are to avail ourselves of those blessings which a bounteous Providence has lavished on our country.

That Ireland is poor, and that poverty begets poverty, cannot be denied. It is also certain that each year which is allowed to pass without some proper and well-combined steps being taken to arrest the torrent which now threatens to overwhelm us in one common ruin, but adds to our difficulty in recovering our last position?

It will be asked, what can a country, situated as Ireland now is, do towards developing her vast resources? At present she cannot command the necessary amount of capital, and capital is absolutely necessary. True, she could offer ample security for a thousand times the necessary amount, but where shall she turn to make that security available? And echo answers, where?

I will, however, venture to make a suggestion. I will point to Scotland, and ask you to look at her as she appeared 150 years ago. She then, as Ireland is now, was poor and unhappy, comparatively speaking, without commerce or manufactures; her ports empty of shipping, and her sterile soil, rendering but a scanty return to the labours of the husbandman; and what is she now? Her towns filled with manufactories and her ports crowded with shipping; her land, too, once so sterile, is now the very garden of the world.

What has wrought this magic change? Shall I tell you? It is her admirable, her most equitable system of banking accommodation: a system which has stood the test of 144 years; a system which is alike remarkable for its soundness, for the security it offers to depositors, and profit to its shareholders, as well as for its extraordinary liberality; a system which makes no difference between rich and poor, high or low, the wealthy merchant and the humble retailer; but offers to all who can in ANY WAY secure the bank against loss, the advantages of its friendly assistance.

It was and is this system which, in giving to Scotchmen the means of developing the resources of their country, has enabled them to make Scotland what she now is.

*It would be but a cruel mockery were I to ask*

if the banking system which prevails in Ireland affords to us the same facilities as the Scotch, or, indeed, any facilities at all, such as would enable us to work out, on a grand scale, the regeneration of our country.

But, I will ask, why should not we also avail ourselves of the vast advantages to be derived from the introduction into this country of a system which, by the experience of a century and a half, has been proved to be so sound, and which has so materially assisted in advancing the prosperity of Scotland?

This is, indeed, a question of vital importance to the people at large, and one which calls loudly for the anxious consideration of the press and the public.

Could we succeed in establishing in this city a bank which would honestly and boldly carry out the Scotch system of banking, it would do an incalculable amount of service to the public, in stimulating our trade, manufactures and commerce.

Its principles would soon spread into the country, where, by affording to the agricultural population the assistance which they require, but cannot obtain, even on the production of the most ample security, it would plant itself as a mighty bulwark between that portion of society which is yet solvent, and the frightful torrent of bankruptcy which threatens to overwhelm them, while, as a money speculation, its success would be unprecedented.

Yours, &c.,

A DUBLIN SOLICITOR.

April 11, 1849.

### AN ESSAY ON THE HEALTHY PRESERVATION OF DOMESTIC CATTLE.

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(Written for the *Irish Farmer's Gazette*.)

"The diseases from which the great majority of domestic cattle suffer generally originate from the want of care on the part of their owners."

When we reflect for a moment on the great responsibility which is attached to every farmer who is the proprietor of cattle, which are destined for the benefit of the public at large; and when we also consider that these cattle are bred, reared, and perhaps fattened by him with a view to his own pecuniary benefit, it is somewhat surprising to me, viewing the subject in my professional capacity, that so little attention should be paid to the comfort of those sheep, cattle, horses, &c., which are under protection (if this word may be so applied); they are either too frequently ignorant or careless as to the due preservation of those creatures they thus domesticate; they neglect, either partially or totally, the natural, organic, and, I may add, moral laws by which the Deity, in

his profound wisdom, has thought fit to regulate the animal kingdom; and thus, even at an early stage of their existence, a foundation for disease is engendered—its proximate causes are brought into action, which, in many cases, do not require a very lengthened period to bring the crisis to a fatal issue. Thus we speedily find that the farmer loses his anticipated profits, great disappointment ensues, and the poor, unfortunate animals undergo a great deal of suffering, much of which, at least, might have been avoided, had he paid only a common share of attention originally to the comforts of his animals.

My object in the present essay is, if possible, to impress these facts upon the mind of the intelligent agricultural reader. I wish him to view the structure of his animals, and, as a comparative anatomist, I tell him that, in the beauty, delicacy, and textures of the organization of the higher orders of animals (especially those domesticated by man), there is scarcely any essential difference between the conformation and functions of the different parts composing their bodies and our own, which was considered by the late venerable Professor Blumenbach, from its anatomical construction, to be the *chief source* of the animal creation. Often, in my country lectures excursions during the winter season, have I lamented to see the newly-dropped lambs and their maternal parents, in the perpetual state, openly exposed in a field, and frequently covered with snow; while, if opportunity served, the poor little creatures would endeavor to shelter themselves by creeping beneath a hedge, or under a tree. I have already clearly demonstrated that all animals thrive and fatten better when allowed a moderate degree of warmth, even under the most unfavourable circumstances. What, then, I ask, must be the sufferings of these poor sheep and lambs, when compelled to suffer the "rude effects of the winter's piercing blast" in this state? I compare them to the females of our own race after parturition, and only wonder that from such ignorant (to speak in the mildest language) and inhuman treatment, the mortality is not greater than we find it; but as the Almighty "tempers the wind to the shorn lamb," so he does to the newly-yeaned one and its dam. As a proof that diseases—even *Phthisis pulmonalis*, or *consumption in the lungs*—is thus early engendered, is shown by the following anecdote:—A few years ago I accompanied my esteemed and talented professional friend, Mr. Whitlaw, in a call he made on Mr. Asser, the officer of the synagogue appointed by the late Very Rev. Dr. Hirschell, the then high priest, or head rabbi, in London, to inspect the different sheep, calves, and other cattle, and other cattle, at the time they were slaughtered. Those whose body and viscera were healthy he placed his official seal upon, and were distributed for sale, by the Jewish butchers in London, to the members of that persuasion.

In conversation, I found this gentleman an ex-

cellent anatomist, physiologist, and pathologist, (the latter branch of science, was, I may say, his *profession*), and he informed me that out of 22 sheep he had seen killed on the day of our visit, only 4 were fit for his people (*i. e.* the Jews) to eat; the 28 were rejected: I enquired what became of those rejected, "Oh, said he, "we sell them to you Christians, you are not so particular in your food. I inspected the lungs of many of the rejected sheep, and found ulcers (tubercles) of all dimensions, while in some, the livers, instead of being firm, and of a fine healthy appearance, were soft, and more like a sponge dipped in dark venous blood, than the natural biliary organ. Surely, these facts which I have here stated ought of themselves to cause a reformation in the treatment of animals generally. It is a subject deserving the attention of the farmer and all persons concerned in the healthy rearing, and preservation of cattle.

Sorry am I to be compelled to record, that farmers in general, pay but little attention to the conditions of the sheds, yards, and the temperature of the places wherein they confine their more valuable species of animals; and yet, in consequence of being thus blind to their own interests, both their cattle and themselves suffer accordingly. It is in the management of our domestic animals, that physiology and the collateral sciences here lend to agriculture their valuable assistance; thus, by our being acquainted with the laws relative to the heat and its phenomena, in connection with physiology, we discover that if the temperature of the apartment or building wherein the cattle are placed, is too low, then the proportion of food which they consume is much greater; and this (as I have already explained) increased amount of provender does not tend to increase the fatness of the animal. But where the farmer has paid proper attention in equalizing the temperature of his cattle-sheds, &c, then we find that corresponding benefits ensue both to man and beast; inasmuch, as the latter not only requires a less quantity of food, but that the animal duly increases directly in proportion. This is a remarkable fact, and one deserving the farmer's remembrance.

An attention to the temperature of the atmosphere, and to the cleanliness of the animals, is highly inducive to their preservation in a state of health. Unfortunately, the farmers generally, are in ignorance of the powerful effects of the air upon animals, but just in proportion as the air is pure or impure, so is their state of health good or bad. The same remark applies to care and cleanliness, and in some farming districts, the people their actually imagine, that the dirtier pigs are allowed to be, the better they thrive.

I have visited stables, where the ammonia which evolved from the urine and litter on which the horses lay, both were so powerful as to sensibly effect my own nose and eyes. Can we wonder then, that the animal, who for many hours is compelled to remain in such an atmosphere, should

be sooner or later seriously affected? *first*, in the disturbance of his bodily functions, and *secondly*, in his organization; yet, strange to say, I have found individuals, who have stoutly maintained, that these noxious ammoniacal gases, and the badly ventilated stables, are not inimical to the health of their horses, but that the maladies under which they labour have originated from other causes.

And in speaking of the origin of the diseases in animals, an able writer, Mr. Johnson, thus truly remarks:—

"In the case of sheep (natives as they are of warm climates, and elevated dry districts), that to keep them on cold, wet, ill-drained lands, or in close comfortless yards, perhaps covered with straw, super-saturated with the most foul and putrefying liquid matters, is a system neither to be held in contempt, nor one which is improbable, by the use of the farmers' own common sense and unaided exertions."

It must be freely admitted, that very little is known respecting the *actual causes* of the numerous diseases affecting live stock, inasmuch as words both rude and, I may say, barbarous, being many of them *provincialisms*, have been gradually incorporated into veterinary practice; the most common definitions being often mere substitutions of unmeaning words for unknown phenomena.

As prevention is, however, far better than cure, and as the animal functions are the same, to a very great extent, as in the human body, so, in many cases, the means that we should adopt to prevent, as well as to alleviate disease in the one case, may be applied in the other. All land animals like warmth: it is natural to their organization; and, as my late friend, Professor Coleman, of the Royal Veterinary College, London, used to observe, "that it was the sudden transition from heat to cold, and cold to heat, that was so productive of inflammatory diseases to horses in general—taking them from a hot stable into the cold atmosphere, and *vice versa*." This observation we may justly apply to mankind, and all the animals we domesticate. Moderate warmth and an uniform temperature in the atmosphere of the stable or building in which the horses or cattle are kept, is highly essential to the due preservation of their health. This is of much greater importance than many persons who domesticate cattle are inclined to believe. Attention must also be paid to the natural habits, kind of food, &c., of the various species of the same order of animals—for the circumstances wherein they are placed frequently cause them to differ materially. The pulsation of a farm cart-horse is rarely higher than 36; but in small and thorough-bred horses, the pulsations of the heart and arteries will frequently amount to 40, 42, or even 45 per minute. If, however, the horse is excited by ill usage, and even if spoken to with harshness, it will often increase to the extent of 10 or 15 per minute.



The natural number of pulsations in the sheep is about 70 per minute. In a healthy ox in Great Britain or Ireland, the average number of pulsations is about 40; but, from the observations which have been made, it appears that the number varies with the climate; for, in the temperature of Louisiana,\* according to Dr. James Smith, the pulse of the ox, when in its natural state, varies from 68 to 75, rising on the slightest degree of excitement to 80. Here is an immense difference, and this may possibly account for the great difficulty the inhabitants of that country find in acclimatizing the ox—an obstacle which does not occur in the case of the horse, which, in the warm climate of Louisiana, is acclimated with considerable facility.

"No general fact appears to be better established in hippo-pathology," observes Mr. Percival; that disease is the penalty that nature has attached to the domestication of the horse. So long as the unbroken colt remains at grass, or in the straw-yard, even though he be houseless or shelterless, but little apprehension is entertained about his health. No sooner, however, does the time arrive for his domestication, than from the day, nay, from the very hour, when he becomes stabled, do we begin to look for his "*falling amiss*," and so prepared for this event do we feel in our own mind, that, should the animal escape all ailment during this probationary stage of his life, we are apt to regard this as a fortunate exception to what seems to be established as a law of nature.

Mr. Percival has published the following table, showing the ages at which horses appear to be the most disposed to certain diseases:—

Diseases.	Patients under 5 years old.	In the 5th year.	Above 5 and under 10 years.	Above 10 and under 20 years.	20 years and upwards.	Total.
Diseases of the lungs	170	30	20	50	10	280
" bowels	10	20	40	70	20	150
" brain	4	2	5	14	2	27
" eyes	30	10	70	35	5	130
Total .. .. .	214	62	135	169	37	557

Of the 557 cases mentioned in the preceding table, which had been under medical treatment, 134 had a fatal termination. The deaths, therefore, were at the rate of 21,03 per cent. In 300 pulmonary cases, 77 died, or 25,66 per cent.

I have already condemned the apathy which is shown towards the degree of temperature and purity of the atmospheric air in which stables ought to be regarded; and when attention is drawn at all to the subject, then it is in general so badly managed, as to be also productive of

baneful effects. Professor Youatt\* justly observed—that the temperature of the stable should, during the winter months, never exceed ten degrees above that of the external air, and during the rest of the year should be as similar to it as possible. It is not so generally known as it ought to be, that the return to a hot stable is quite as dangerous as the change from a heated atmosphere, to a cold and biting air. Many a horse that has travelled without injury over a bleak country, has been suddenly seized with inflammation and fever, when he has, at the end of his journey, been surrounded with heated and foul air. It is the sudden change of temperature, whether from heat to cold, or from cold to heat, that does the mischief, and yearly destroys a multitude of horses. The stable should be as large, compared with the number of horses which it is destined to contain, as circumstances will allow. A stable for six horses should not be less than forty feet in length, and thirteen or fourteen feet wide. If there be no loft above, the inside of the roof should always be plastered, to prevent direct currents of air, and occasional droppings from broken tiles; the heated or foul air should escape, and cool as well as pure air be admitted, by an elevation of the central tiles, or by large tubes carried through the roof, with caps a little above them, in order to prevent the beating in of the rain, or by gratings, placed high up in the walls. These latter apertures should be as far above the horses' heads as they can be conveniently placed, by which means all injurious draughts will be prevented. If there is a loft above the stable, the ceiling should be plastered, in order to prevent the foul air from penetrating the hay above, and injuring both its taste and its wholesomeness; and no openings ought to be allowed above the racks, through which the hay may be thrown into the rack, for they also will permit the foul air to ascend to the provender; and, in the act of filling the rack, and while the horse is eagerly gazing upward for his food, many a grass-seed has fallen into his eye, and produced considerable inflammation; whilst, at other times, when the careless groom has left open the trap-door, a stream of cold air beats down upon the head of the horse. The stable with a loft above it, should never be less than twelve feet high, and proper ventilation should be secured either by tubes carried through the loft to the roof, or by gratings close to the ceiling. These gratings or openings should be contracted or enlarged, by means of a covering or shutter, so that, during spring, summer and autumn, the stable should possess nearly the same temperature with the open air, and in winter a temperature not more than ten degrees above that of the external atmosphere. A hot stable has, in the mind of the groom, been long connected with a glossy coat. The latter, it is thought, cannot be attained without the former. To this

\* Journal of Agriculture, vol. ii., p. 91.

\* "The Horse," by W. Youatt, p. 246.

we should reply, that in winter, a thin glossy coat is not desirable. Nature gives to every animal a warmer clothing when the cold weather approaches. The horse acquires a thicker one, in order to defend himself from the surrounding cold. Man puts on an additional and a warmer covering, and his comfort is increased, while his health is preserved by it. He who knows anything of the horse, or cares anything for his enjoyment, will not object to a coat a little longer and a little roughened, when the wintry wind blows bleak. The coat, however, need not be so long as to be unsightly; and warm clothing, even in a cool stable, will, with plenty of honest grooming, keep the hair sufficiently smooth and glossy to satisfy the most fastidious. The overheated air of a close stable saves much of this grooming, and, therefore, the idle attendant unscrupulously sacrifices the health and safety of his horse. Of nothing are we more certain than that the majority of the maladies of the horse, and those of the worst and most fatal character, are, directly or indirectly, to be attributed to the unnatural heat of the stable, and the sudden change of the animal from a high to a low, or from a low to a high temperature.

The decided bad effects of confined air, we find exhibit themselves in apparently a much quicker manner in the case of the smaller animals; for example, the pernicious effects and offensive odours of the small granivorous birds, and the short duration of their lives, when placed in close rooms and densely populated districts, is well confirmed by the London bird-fanciers. "It is well known," observes Dr. Arnott, the celebrated philosopher,\* "that a canary bird, suspended near the top of a curtained bedstead, in which people have slept, will generally, owing to the impurity of the air, be found dead in the morning; and small close rooms in the habitations of the poor, are sometimes as ill-ventilated as the curtained bedsteads." With respect to cattle, slaughter-men have certainly cogent reasons for arriving at the conclusion that it is the effluvia of the slaughter-houses which causes them to lose their appetites, and, as a matter of course, their general health must suffer to a greater or less extent.†

That the effects of cold are exceedingly prejudicial to the fattening of animals every farmer is aware; that they require cleanliness, quietude, and warmth every proprietor of live stock, who has paid the slightest attention to the subject, readily allows that these are highly conducive to the health of the horse and the ox. The same observations apply to the pig. Those pigs whose styes have a southern declination, thrive much better than those which are situated in a colder aspect; they can hardly, perhaps, be kept too warm or too clean, and the more recent ex-

periments of Mr. Childers and others have demonstrated the fact, that the domestic sheep is not an exception to the rule. This sheltering of sheep, on an extensive scale, can, and ought to be generally practised, and doubtless the farmer will find it to his profit in doing so.

If the benefits which are to be derived from a close and unremitting attention to the dwelling of the animal is paid when it is in the field, how much more important is it that such should be the case when the creature is placed in a confined situation. It is, however, but seldom, I regret to say, that the proprietors of live stock avail themselves of the practical benefits which the labours of philosophers, and more especially modern agricultural chemists, have clearly demonstrated that it would be for their own interest to pursue. They have very evidently proved that animals cannot be properly managed without attention is paid to the situation of the buildings in which they are placed, so that, in point of fact, the farmer must pay regard to the purity of the air, the temperature, and even the light of the dwelling-places of his cattle, if he is anxious to make them profitable to him. A few practical facts may not be without their value to the agriculturist; consequently, I shall detail some which illustrate this important subject.

From what I have already stated, I think that I have proved the necessity there exists that the animals should enjoy pure air. It is of great importance to their health that they should enjoy it. For want of it, medical men who have paid attention to the comparative pathology of animals, attribute the origin of those extensively fatal pulmonary maladies to which stall fed cows are frequently subject. In a government publication,\* it is remarked, that "the spread of the knowledge of the fact, that animals are subject to *typhus*, *consumption*, and the chief train of disorders supposed to be peculiarly human, will, it may be expected, more powerfully direct attention to the common means of prevention."

#### CHEMICO-AGRICULTURAL SOCIETY— MODEL FARM.

Dr. Hodges proceeded to make the following observations on the resolution of the Society to establish a model farm. I have, he said, so frequently stated my opinion on the subject of connecting a farm with the Society, and you are all so fully agreed upon the advantages which may be expected from combining the researches of the laboratory with field experiments, that it is unnecessary to urge them upon your consideration. It may, however, be useful to make a few observations with respect to the plans which I trust you may be enabled to carry out, in the contemplated establishment. We have, in Ireland, several model farms, as they are called; and it is to be expected, that the farm of

\* First Report on the Health of large Towns, p. 61.

† Report on Inierment in Towns, 10.

\* Report on the state of large towns, p. 41.

the National Board, at Glasnevin, under the superintendence of two members of our Society, Dr. Kirkpatrick and Mr. Donaghy, will be made a most useful institution; but at the present time, these establishments do not, I conceive, answer the purposes which must be kept in view, in the existing condition of Irish agriculture, and especially by a Society associated for the purpose of advancing our knowledge of those principles upon which the profitable cultivation of the soil must be based. It was hoped, that in connexion with the new Provincial Colleges, experimental farms would be established. This, however, is not to be the case; and it therefore becomes necessary that this Society should no longer delay. The efforts of this Society, in awakening the attention of the farmers of this province to the importance of a higher knowledge than that which was formerly regarded as sufficient, have been most successful. An establishment of the kind proposed will enable the Society to unite practice with theory, and give the pupil educated in the laboratory, or instructed in the lecture room, an opportunity of testing the correctness of the various theories which at present agitate the minds both of scientific agriculturists and practical farmers. It will enable the Society to institute such experiments as the farmers of this country cannot be expected to undertake. It will give us an opportunity, not merely of investigating the advantage of the various modes of practice, but also of contributing towards the attainment of facts, which may serve to advance the science of agriculture. Thus, it will afford a means of carefully studying the operations of the various kinds of manure, respecting which such a diversity of opinion prevails, and lead to the establishment of truths, which may serve to guide the practical man in his operations. Under the direction of the many excellent farmers who interest themselves in the working of the Society, there is every reason to expect that the farm will be conducted so as to be made, what every institution of the kind should be—a pattern farm. Such an institution, to obtain the confidence of the public—to be really useful—should above all things, in every department, be conducted so as to afford an example of the economical value of the various plans pursued. The cost of every turnip and head of wheat produced, should be accurately calculated and published to the kingdom. The chemical constitution of the soil, and of every specimen of manure applied, should be carefully examined, and the produce should be tested, not merely by its quantity, but by its composition, as determined by analysis. At the present time, strange to say, there is not a single model farm in Ireland the soils of which have been chemically examined. We may also hope, that the liberality of the many wealthy proprietors in connexion with the society, will afford the council

the means of undertaking such experiments, with regard to the relative value of the different breeds of cattle, plans of feeding, &c., as may afford useful information to the country, and that he will be supplied with agricultural implements of the most approved construction. In other countries, governments conceive that it is their interest to do for agriculture what your Society now proposes to accomplish. Even in Russia, a country which we are accustomed to regard as so much inferior to our own in civilization, the Emperor is a munificent encourager of agricultural knowledge, justly believing it to be the surest foundation of the wealth and happiness of states. Norway also, though a poor country, supports her schools of agriculture; and almost every petty state in Germany possesses its experimental farm and well-managed agricultural college. I find, by a number of the *Albany Journal*, which I lately received from Mr. B. P. Johnston, the indefatigable secretary of the noble New York State Agricultural Society, that on the 4th of January, the governor of the state addressed a message to the society, urging upon them the establishment of an agricultural school and model farm. That our farmers are alive to the importance of agricultural knowledge, the rapid progress of this Society, from very small beginnings, and the increased taste for agricultural literature affords, I conceive, very strong evidence. The establishment of schools of agriculture in the new colleges, which, it will be recollected, was recommended by this Society, in an address to the present Lord Lieutenant, who, in the best sense of the words, has shown himself "the farmer's friend," leads us to hope that our rulers are beginning to perceive that the interests of this country may be materially promoted by such means as will more completely qualify the cultivators of our soil—the producers of our food—for the successful prosecution of their most important avocation. It may be a considerable time before the Society can accomplish all that I have proposed; but we can make a beginning; and, at all events, whether upon five or thirty acres, we must labour that our work be capable of affording us useful lessons to the country.—*Northern Whig*.

**MONSTER PIG.**—Mr. Joseph Smith, the landlord of the Odd Fellows' Hall, Braintree, has in his possession a sow, which for size and exact symmetry of shape, we understand, has not an equal in England. Its length, from the root of the tail to the end of the snout, is 10 feet 3 inches, its height is 3 feet 7 inches, its girth over the shoulders is 7 feet 6 inches, and its weight is 70 stone. The animal is only two years old, and lives upon the coarsest of food. It is supposed that when fed it will weigh upwards of 100 stones, 14 lbs. to the stone.

## THE PRINCIPLES AND PRACTICE OF GREEN CROPPING, &amp;c.

## GENERAL PREPARATORY CULTIVATION.

The preparatory operations for green cropping being the same for every variety, it will save much repetition afterwards. If I describe them now. The first thing to be done is, to plough or dig the land in the end of autumn; and when this is done, it must be remembered that a mere scratching of the surface will not suffice. A good, deep stirring of the soil at this time will not only save much after labour, but will tend greatly to increase the weight of the crop. Green crops are deep-rooted plants, and if the soil be shallow, the produce will not be so abundant as it will be in land which is either naturally deep or has been made so artificially. When the spade is used, the depth can be regulated to an inch; but this is not always the case where horse labour is used. Large farmers, who have three or four teams of good stout horses, can use the subsoil plough; but the great majority of farmers in this country who keep horses cannot use this valuable implement, from the weakness of their horses, or from their not having a sufficient number to carry on the work properly. In such cases, bullocks may be employed with advantage, and, although they are much slower at work, they have this advantage over horses, that, when not required, they can be fed off. A tolerably good substitute for the subsoil plough can be obtained by taking the mould-board off a common plough, and running it in the furrow made by a plough with the mould-board on, which goes before it. By this means the soil will be stirred from twelve to fourteen inches in depth. In whatever manner it is to be performed, the land must be deeply stirred. But it must not be imagined that the effects of this deep working are confined to the green crops alone; they will be found to extend over the whole rotation; for the greater the body of loose soil into which the roots of plants can penetrate, so much greater will be the produce of all kinds of crops. This is an important fact, and one which ought never to be forgotten; and it is one which also tends to prove that green crop culture is the foundation of a profitable system of farming. The land having been treated in this manner, is allowed to remain untouched until spring, when, having received the benefit of the winter's frost—destroying insects and the roots of tender weeds—it will be found to be very considerably ameliorated, and in a fit state for further operations. As early a period as the other spring labours will allow, the land must receive a cross ploughing, which will be followed by harrowing. At this stage, all root weeds which are tossed by the harrows, ought to be carefully gathered and carried off the field. To assist in this, as well as in still further pulverizing the

soil, the grubber will be found a very efficient instrument. The roller will also be called into operation to assist in breaking the large clods; and until the soil is reduced in a proper state, the various operations of ploughing or grubbing, harrowing and rolling, accompanied at each turn with a careful eradication of weeds, must be carried on. When the spade is employed, as ought to be the case on small farms, such a multiplicity of operations will not be required, because one good digging will do more to breaking down the lumps, than several turns of the plough, and the weeds can be tossed out on the surface at the time the work is going on. But to be efficient, this must be done carefully, for the slightest slovenliness or carelessness will tell on the productiveness of the crop. I must remark, that wherever I have found spade husbandry followed by small farmers, I have also invariably found a desire to lessen personal labour as much as possible; and it will always be the same until they become better acquainted with the immense importance of careful cultivation. In particular, they are remarkably careless about the destruction or eradication of weeds, and the consequence is, that we find two-thirds of their farms employed in growing plants of no use to them whatever, and which prevent the growth of valuable plants.

These preparatory operations having been pointed at, we shall now describe the culture of each variety of green crops.

## PARSNIPS.

If there be a sufficient supply of manure, the best time to apply it for parsnips, is when the land is receiving the preparatory ploughing or digging in winter, taking care that it is properly covered; but if the supply is limited, then it must be prepared during the winter months; first, by being carried to the field, and there made up in a square or oblong heap, which must be turned twice at least before being used. Long, unfermented dung will not do for parsnips, or indeed for any description of green crops; but it is quite common to see the manure put into the drills, either in a fresh state, or, from inattention to its preparation, quite burnt and useless. It is in vain to expect good, or even average crops, if this be done; but it is done, and hence in a great measure, arises the frequent blanks we see in green crops in this country.

Parsnip seed is sown during March, and until the 10th of April; the sooner the better; and as it is a considerable time in starting, it must be steeped for two or three days previous to being sown, either in soft water, or in the liquid drainings from the dunghill, considerably weakened by being mixed with water. A little dry sand or earth may be mixed with the seed after it is taken out of the steeping tub, which will allow it to be more easily sown. There are two modes

of growing parsnips, and indeed green crops generally, which I shall describe; these are, in drills and in beds.

When the first method is adopted, which will be the case if horse labour is employed, the drills will be opened from twenty-two inches to two feet apart. If manure has not been ploughed in, as already directed, it must now be laid down in small heaps along the drills; immediately afterwards shaken out, and spread equally in the hollows between the drills; and as soon as it is spread, the plough must return and cover the manure by splitting the previously formed drills. When manure has been previously ploughed in, and when the farmer is able to procure guano, a little of this (say, at the rate of one and a half to two cwt. per statute acre), may be sown broadcast before the drills are formed; or mixed with five or six times its bulk of dry earth, and dibbled into holes along the top of the drills. Into these holes the seed will also be sown, but care must be taken that the guano and the seed do not come into contact, otherwise the vitality of the latter will be destroyed. Whether guano is applied or not, the seed is sown into holes about one inch or one and a half inch deep, seven inches apart, and two or three seeds in each hole. A light roller is then passed along the drills. From six to seven pounds will be required to sow a statute acre; and the best variety is the Jersey hollow-crowned.

Drill culture may also be adopted by the small farmer, whose only implement is the spade. The drills may be raised by a shovel, a garden line being used to keep the drills straight and at equal distances apart. But by farmers of this class, it will be found more advisable to cultivate their parsnips and other green crops in beds—a mode originally introduced by Mr. Kelly, of Portrane, and which is admirably adapted for green crop culture.

In following this method, the land is dug, or otherwise prepared in winter, as already described. In spring it receives another ploughing or digging, and is then levelled and marked into beds  $4\frac{1}{2}$  feet wide, with a division of about eighteen inches by two feet (according to the depth of the soil) between each bed. If the manure has not been early applied, it is now spread equally over the beds, and covered with earth taken from the intermediate alleys. Mr. Kelly's plan, a line is stretched along the centre of the bed, and the seed dibbled in, as already directed, along the line. This central row will be 27 inches distant from each side of the bed. After this is done, set the line 20 inches from the centre on one side, and again dibble in the seeds; and, in like manner, shift it again 20 inches on the other side of the centre row, and sow again. There would thus be three rows in each bed. But I have found it much more convenient, especially for the after culture of the crop, to dibble in the seeds in rows across the beds, as

the whole after operations can be carried on by persons standing in the alleys, without putting a foot on the beds.

The after cultivation of parsnips consists in regularly taking out all weeds as they appear, in thinning out the plants to one in each hole, when they are about three inches high, and in digging, forking, or grubbing the spaces between the rows or drills, so as to keep the land always free and open, and to prevent any crust forming on the surface. It is absolutely necessary that these operations be carefully performed, otherwise a crop cannot be expected; but in general these are operations which we find either entirely neglected, too long delayed, or very imperfectly performed when done.

Parsnips, when boiled, are excellent feeding for pigs, milch cows, and poultry, and bread of the best quality is made when they are mixed with wheaten or barley meal. They may be given raw to cows, and they impart a very pleasant flavour to milk and butter, besides giving the latter as good a colour as that produced by cattle fed on the richest natural pastures. Altogether the parsnip is a most excellent vegetable, and well worthy of being much more extensively cultivated than it is at present. The only practical objection which is made to its culture is, that owing to the early period at which the seeds must be got in, the land cannot, in wet seasons, be sufficiently cleared of weeds; but this objection can be obviated by clearing the land properly in autumn, which those who use the spade can very easily accomplish.—*Farmer's Gazette*.

#### CHEAP AND EFFECTIVE SUBSOIL PLOUGH.

SIR,—In one of your late numbers I saw the price of a subsoil-plough, which is higher than the price of a very excellent and efficient plough, of which I send you a description:—

A wooden or iron beam of usual length and substance, a moveable wheel, to regulate teens; first leg is of flat iron, sharpened at front and studded at point, like a coulter, and answering to a pick; substance  $3\frac{1}{2}$  inches on flat, by three-fourth inch at back; and second leg, with foot answering to strong hoe, edged like first leg, and of same substance. The plough is drawn from first leg, and the draft bar or rod is raised or lowered by a screw in or on beam; legs fixed in their mortice by screws; legs or teens about 2 feet long.

I have a Smith's plough, which cost me £6 6s., and I find I can do as good work with three horses as could be done with Smith's with six or eight horses, and the price is only 26s. with oak beam, and 34s. iron. It is a most useful tool, and I have made many and sent away from my village. It may be worked with one, two, or three horses. It acts as a horse-shoe in

narrow drills; one may one-third subsoil between potato drills, and with great benefit to the crop. It never gets out of order, except from wear, and is so light that it may be carried on the shoulder, and yet so strong as to bear any hardship. I have used mine for five years on every sort of ground, over rocks and clay, and never had an accident.

If you think the formation respecting the plough worth your notice, and wish for more, I shall be happy to supply it.—Yours, &c., R. R. WRIGHT, Markham Rectory, Stratton, Cornwall, Feb. 28, 1849.

NOTES OF THE FIELD.

REARING OF CALVES.—The mucilage used for the rearing of my calves is made as follows, viz. :—Thirty quarts of boiling water are poured on three quarts of linseed meal, and 4 quarts of bean meal, all then covered close up; and at the end of 24 hours added to 31 other quarts of boiling water then on the fire, being poured in slowly to prevent lumps, and being well stirred with a small flat shovel-shaped board, perforated with holes to produce thorough incorporation.

About 30 minutes boiling and stirring the mucilage is put by for use, to be given blood warm to the calves as soon as they are three days old; first, in equal portions with new milk, increasing gradually to two-thirds as the calf gets older, substituting skim milk after a month, and feeding on mucilage alone after 6 weeks. The cost of this mode of feeding will be as follows, viz. :—

Week.	New milk.	Skim milk.	Mucilage.	Total.
	quarts.	quarts.	quarts.	quarts.
1st	22	...	10	32
2nd	21	...	21	42
3rd	20	...	29	49
4th	20	...	36	56
5th	...	20	43	63
6th	...	20	50	70
7th to 15th	...	...	756	756
	83	40	945	1068

Thus we have—

	£	s.	d.
20 $\frac{3}{4}$ gallons new milk, at 4d. ... ..	6	11	
20 " skim " 2d. ... ..	3	4	
236 " mucilage " 1d. ... ..	19	8	
	1	9	11

The linseed now using at my farm was imported by me from London in February last, at a cost of 6s. per bushel, or 9d. per gallon. It is of good quality, being some of that sold for seed in 1848. My beans are "Egyptian," and cost 6d. per gallon. Grinding the beans at a neighbouring mill, and the linseed at the farm by one of

"Dean's" (of Birmingham) flax crushers, will be about  $\frac{1}{2}$ d. per gallon; three quarts of linseed and four quarts of beans, at these rates, will cost 1s. 1 $\frac{1}{2}$ d., but as grinding increases the bulk about one-third, we have 9 quarts of mixed meal, at 1 $\frac{1}{2}$ d. per quart, seven quarts of this producing 15 gallons of  $\frac{1}{2}$ d. per gallon; allowing another farthing for fuel and attendance, we shall have the entire cost of about 1d. per gallon for the mucilage, as just mentioned. All the calves reared by me on this system grew well, were healthy, strong, and in excellent condition, and being fed abundantly three times a day, they were generally tranquil and contented, not sucking one another as in the old system, and did not require separate cribs for their confinement.

Some breeders do not allow more than 8 or 10 quarts of liquid per day to their calves at any period of their growth, give them cut turnips, ground oats, hay wash, &c., at six weeks old, and assure us that they thrive as well on such treatment as on new milk. The result of my experience is against their system, and I do not believe that any mode of feeding will produce so large or so healthy an animal upon such economical terms as the one which I have described.

The season having now arrived when all my attention will be required to the labours of the field, I take leave of your readers for the present, I remain, &c., CHARLES BEAMISH.—Cork Constitution.

MISCELLANEOUS.

Whenever there is a strong determination to attain an object, it is generally sufficient in itself to create the means, and almost any means are sufficient. We mistake in supposing that there is only one way of doing a thing—namely, that in which it is commonly done. Whenever we have to prove it we find how rich in resources is necessity; and seldom it is that, in the absence of the ordinary instrument, she has not some new invention to supply its place. This is a fact which studious poverty has often had experience of, and been all the better for experiencing; for difficulties so encountered and subdued, not only whet a man's whole intellectual and moral character, but fit him for achievements in after life from which other spirits less hardy turn away in despair.

CONTENTMENT.—Content converts everything near it to the highest perfection it is capable of. It irradiates every metal, and enriches lead with all the properties of gold; it heightens smoke into flame, flame into light, and light into glory; a single ray of it dissipates pain, care, and melancholy from the person on whom it falls. In short, its presence naturally changes every place into a kind of heaven.

**PROFITS OF PIG FEEDING.**—As the slaughtering season is now closed, the three following cases may be considered a criterion of the profit derived from pig feeding. The three pigs were two years old, and had had three litters each, which would average £30. The least belonged to Mr. Marsden, and when killed weighed 642 lbs., at 5d. 3¼ per lb., amounts to £15 7s. 7½, and by adding £30 for the young pigs, makes the amount of £45 7s. 7½. The first cost and the extra keep, exclusive of the waste from the house, and the feeding, was £7. By deducting this £7, it leaves a nett profit of £38 7s. 7½.—The second belonged to Mr. Houlton, and weighed 674 lbs., which at 5½d. per lb. amounts to £16 2s. 11¼. In this pig the two leaves of fat weighed 48 lbs., and the loose fat 30 lbs., making a total of 78 lbs. of fat, which was considered extraordinarily great; and by adding its pigs its value is £46 2s. 11¼d.; deducting £7 for its extra feed, it leaves a nett profit of £39 2s. 11¼d.—The third belonged to Mr. Bailey, and weighed 803 lbs., which at 5½d., amounts to £19 4s. 9¼d.; its young pigs makes £49 4s. 9¼d., and deducting £7, it leaves a profit of £42 4s. 9¼d. The nett profit, therefore, of these three pigs, is £119 15s. 4¼d., besides the valuable manure they made during the two years.—*Correspondent of the Lancaster Guardian.*

What can equal this ?

The cattle show and exhibition of agricultural implements, held on Wednesday, at Poissy, was most numerous attended; graziers, and breeders, and farmers coming from all parts of the country. A great many of the representatives of the people were also there. At twelve o'clock the President of the Republic arrived, and was received with general and cordial cheers, as he visited the field in which the cattle were arranged. The distribution of the prizes commenced at one o'clock, the President of the Republic taking the chair, with the Minister of Commerce on one side, and the Prefect of the Seine-et-Oise on the other. The day concluded with a grand banquet.—*Paris Paper.*

Such is the estimation of agriculture in France. In Canada its importance does not appear to be understood, and therefore not acknowledged.

**ANGER.**—Nothing is so inconsistent with self-possession as violent anger. It overpowers reason; confounds our ideas; distorts the appearance; and blackens the colour of every object. By the storms which it raises within, and by the mischiefs which it occasions without, it generally brings on the passionate and revengeful man greater misery than he can bring upon his enemy.

**PREPARING FOR, AND SOWING BEANS.**—The beans will send their roots down to a vastly greater depth in search of food than you can possibly plough in the manure, so you need not be alarmed at what your neighbours say on that score; you say the land is too wet for sowing in drills, and that you intend sowing them broadcast; we would rather advise you to sow the land into beds from six to eight feet wide; harrow down the ridges and sow the beans in drills, two and a half feet apart across the beds; you can open the drills three inches deep with a garden hoe, or dibble them at that distance, the beans being dropped in with care at four inches, bean from bean; to sow them broadcast, if the ploughing is executed neatly and well, the furrow-slice being ten inches by seven inches deep, the beans may be sown previous to harrowing; but if bad or roughly executed, the land should get a rough harrowing before sowing the seed, and be well harrowed after. A bushel of beans, according to the size, weighs from 60 to 68lbs.

Let us beware of evil thoughts. To harbour them is to harbour a merciless tyrant, who will fetter every attribute of the godlike soul and kill the very life of virtue; to harbour them is to harbour moral defilement, and guilt, and death itself; nay to harbour evil thoughts is to harbour so many devils, who will riot on all that is fair and good within, and drive the possessed mortal on and down to eternal perdition! Beware of evil thoughts! Watch against them—pray and strive against them! The mastery over these is everything—virtue, obedience, life everlasting; but defeat here is the loss of all things—self command, the grace of God, the hope of heaven, the soul itself, with its power of endless thinking, and endless happiness!

All who have meditated on the government of mankind have been convinced that the fate of empires depends on the education of youth.

The most ignorant are the most conceited, and the most impatient of advice. They are unable to discern either their own folly or the wisdom of others.

To do the best is a duty, but to be uneasy at what cannot be helped is a fault; for this world, and the things of it, are mutable.

If there is a regard due to the memory of the dead, there is still more respect to be paid to knowledge, to virtue, and to truth.

Nature teaches us that we are all dependent—that we are like cog wheels, pushing each other along by filling up mutual voids.

**HOME TRUTHS.**—Every man has in his own life follies enough—in his own mind trouble enough—in the performance of his duties deficiencies enough—in his own fortunes evils enough, without minding other people's business.

The selfish man may accumulate the most property, and the benevolent man is most happy; the former may roll over beds of golden sands, and be the most miserable of God's creatures, whilst the latter has a peace and joy within which he would not exchange for all the world.

Even as the wintry blast strippeth of its leaves the tree, so doth the knowledge of the world take from a young heart its brightest expectations.

Fresh air, pure simple food, and exercise, mental and bodily, with an elevated ambition, will confer on the greatest age a dignified beauty, in which youth is deficient. There are many men and women at sixty younger in appearance and feeling than others at forty.

### SHORT-HORN DURHAM CATTLE, AT AUCTION.

THE Subscriber being about to dispose of 50 acres of his grazing farm for public purposes, will offer at public sale 30 head of SHORT-HORN DURHAM CATTLE (being about one-half of his present herd), at his farm  $2\frac{1}{2}$  miles from the City, on the 13th day of June next, at ELEVEN o'clock in the forenoon, consisting of yearling, two year and three year old Heifers and Cows; and eleven young BULLS from ten months to two and a half years old. Great care has been observed, and considerable expence incurred, in selecting and breeding this stock with reference to purity of blood and dairy qualities.

The awards of the New York State Agricultural Society, and the New York American Institute attest the estimation in which this stock is held wherever it has been exhibited for competition. About eight head of the above cattle are a purchase made from E. P. Prentice, Esq., of Albany, last May. Being all the Short-horns of that gentleman, and the products of his four selected cows, retained at his public sales, these latter animals possess the strain of blood of the herd of Mr. Wtaker of England, from whom Mr. Prentice made his principal importation. The other portion of the young animals partake largely of the blood of the celebrated herd of Thomas Bates, Esq., of Yorkshire, England, from whom my importations have been derived. They are mostly of the get of my imported Bulls, Duke of Wellington and premium Bull Meteor. The Heifers and Cows are and will mostly be in calf by the latter Bulls.

For the information of such as may doubt the successful propagation of this valuable breed of Cattle in a warmer climate, I introduce here an extract of a letter I received from A. G. Summer, Esq., Editor of the South Carolinian, dated Columbia, 25th January, 1849:—"The Bull you sold Colonel Hampton of this State, gives him great satisfaction; he is a fine animal, and I only wish you could see some twenty head of his get now in his yard. They are the most superior Yearlings ever bred in the South." The pedigree of this stock will be issued one month previous to the sale. A credit of six to eighteen months will be given on the stock.

GEORGE VAIL.

Troy N. Y., April 2, 1849.

### GUILBAULT'S

### BOTANIC & COMMERCIAL GARDEN,

*Cote des Neiges, adjoining the Chapel.*

THE Proprietors of this Establishment invite Public attention to their large assortment of every description of FRUIT & FOREST TREES, ORNAMENTAL SHRUBS, ROSES, DAHLIAS, GREEN HOUSE PLANTS, &c., &c., which they will sell cheap for cash or approved credit.

Orders left with Messrs. S. J. Lyman & Co., Place d'Armes, or J. E. Guilbault, Cote des Neiges, will receive punctual attention.

Please call and visit the Establishment so as to judge for yourself.

### TOAMATEURS OF POULTRY AND PIGEONS.

THE Proprietors of GUILBAULT'S BOTANIC and COMMERCIAL GARDEN have the pleasure to acquaint the Public, that they have completed their collection of Poultry and Pigeons, the collection being the rarest ever seen in America. Persons desirous of procuring some of them will please order now or inscribe their name, specifying the sort. The first ordered, the first served.

#### FOWLS:—

Pure White Top Knot,  
Black Poland or Top Knot,  
Silver Pheasant Top Knot,  
Golden Pheasant Top Knot,  
Malay Breed,  
English Dorking,  
Creole or Bolton Grey,  
Buck's County Fowls,  
Game of *Flinn Breed*,  
Iroquoise or Rumpel,  
True *Cochin China*, the pride of England,  
Santa Anna or Gofelue,  
Pure White Bantam,  
French Bantam,  
Sir John Seabright Golden Bantam, Clean Legs.

#### GEESE AND DUCKS:—

Bremen Geese, weighing over 20lb. each,  
Chinese Geese—Wild Geese,  
Muscovy Duck,  
Aylesbury White Duck,  
Pure White Top Knot Duck,  
Black Top Knot Duck,  
Rhone Duck, large,  
White Turkey, pure,  
Guinea Hen,  
Peacock.

#### PIGEONS:—

Fan-tail, pure white and others,  
owter,  
Frisle or Jacobin,  
Nun's—Magpie—Gull,  
Trumpeter,  
Egyptian,  
Cinemome Tumbler,  
Deep Red do  
Blue Baldhead do  
Almond do scarce,  
Kite do  
Black Baldhead do  
Splashed do

They are warranted Pure Breed.

The collection can be seen any time after 1st May.



## FARMING IMPLEMENTS.

WE, the undersigned, certify that we have carefully inspected a variety of Farming Implements manufactured by Mr. A. Fleck of St. Peter Street, and we feel great pleasure in recording our unqualified opinion that they are very much superior to any article of the kind which we have seen manufactured in the country, and equal to any imported.

And we would particularly recommend to the notice of Agriculturists throughout the Province his Subsoil Grubber, which he has improved upon from one which took a premium of £10 from the Highland Society of Scotland. This implement seems well adapted to improve and facilitate the labours of the Farmer, and we cannot doubt that it will soon be extensively used in improved cultivation. His Scotch and Drill Ploughs are also very superior, and well worthy of the inspection of every one desirous of possessing a valuable article.

M. J. HAYS, Cote St. Antoine,  
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TO THE AGRICULTURISTS OF CANADA.

## SCOTCH PLOUGHS, &amp;c.

ALEXANDER FLECK, BLACKSMITH, St. Peter Street, has on hand and offers for Sale, SCOTCH PLOUGHS, made from WILKIE & GRAY'S Pattern, of a superior quality and workmanship, warranted equal to any imported.

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DRILL PLOUGHS, SCUFFLERS & DRILL HARROWS, of the most approved and latest patterns, and CHEESE PRESSES of the Ayrshire pattern.

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March 1, 1849.

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THE Subscriber has on hand three REAPING MACHINES of the latest and most improved construction, capable of cutting twenty-two acres per day. Being manufactured by himself, he is prepared to warrant both material and workmanship as of the best order. PRICE—MODERATE.

MATTHEW MOODY, Manufacturer,  
Terrebonne, July, 1848.

## NEW SEED STORE.

THE Subscriber begs to acquaint his Friends and Customers that he has, under the patronage of the Lower Canada Agricultural Society,

OPENED HIS SEED STORE,

At No. 25, Notre Dame Street, Opposite the City Hall,

Where he will keep an extensive assortment of AGRICULTURAL and GARDEN SEEDS and PLANTS of the best quality, which he will dispose of on as favourable terms as any person in the Trade. From his obtaining a large portion of his Seeds from Lawson & Sons, of Edinburgh, who are Seedsmen to the Highland and Agricultural Society of Scotland, he expects to be able to give general satisfaction to his Patrons and Customers. He has also made arrangements for the exhibition of samples of Grain, &c., for Members of the Society, on much the same principle as the Corn Exchanges in the British Isles. He has a large variety of Cabbage Plants, raised from French seed, which he will dispose of to Members of the Society, at one fourth less than to other customers.

GEORGE SHEPHERD.

P. S.—An excellent assortment of Fruit Trees, particularly Apples, which he will dispose of at one-fourth less than the usual prices. Also, a large quantity of fresh foreign Clover Seed.  
Montreal, April 1849.

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